

476.

Life and Living 1

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For pupils in Tropical Pre-secondary Schools — A Practical and Pictorial Course in Nature Study

Notes to Pupils


This book has been written to help you see properly and understand the very wonderful world around us.

It is a 'doing' book, full of experiments for you to do, things to make and things to collect.

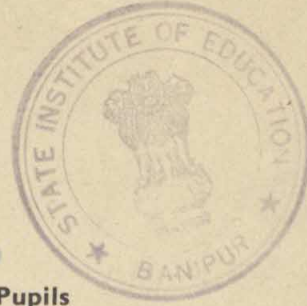
Your teacher will explain all these things to you, but you will have to make sure that, whatever happens, you bring all the things you need to school, so that everybody can get the greatest pleasure out of the lessons.

None of the drawings or pictures in this book are for you to copy. They are there to help you to understand and draw things you really see for yourself. They are *not* to be copied into your exercise books at all.

Illustrations by Valerie Herbst



Life and Living 1



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LONGMANS

'CUT-IN-HALF' PICTURES

Many pictures in this book are 'cut-in-half' pictures. They help you to understand what is inside things, and how they work.

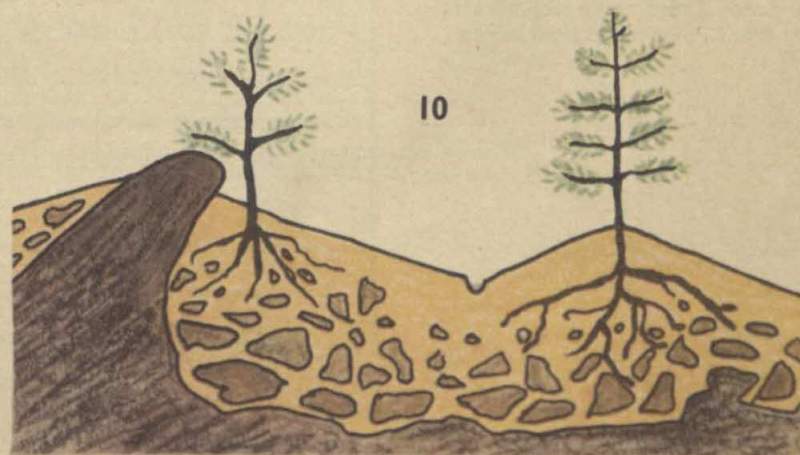
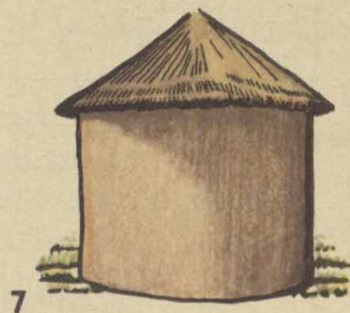
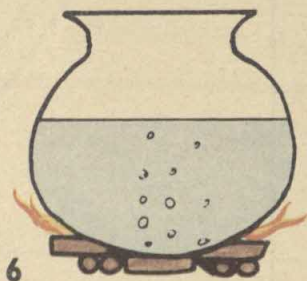
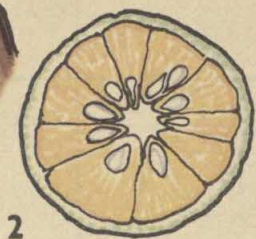
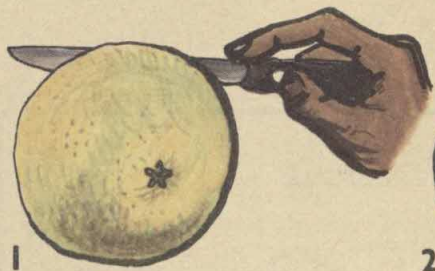
On the opposite page is an orange (1) with its 'cut-in-half' picture 2.

The flower 3 is cut in half and you can see inside 4; 5 and 6 show a 'cut-in-half' cooking pot, and 7 and 8 show a 'cut-in-half' house.

Even a hill can be shown as a 'cut-in-half' picture. Your teacher will help you to understand pictures 9 and 10.

Try 1, 2, 3 and 4 and draw what you see when you have cut the things in half.

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GETTING READY TO LOOK AT LIVING THINGS

Collecting and writing about what you see

Always have one or two pages of your exercise book ruled like this, ready to fill in. When they are full rule some more. Though you will spend the first lesson ruling your book, you will fill in the page in your spare time.

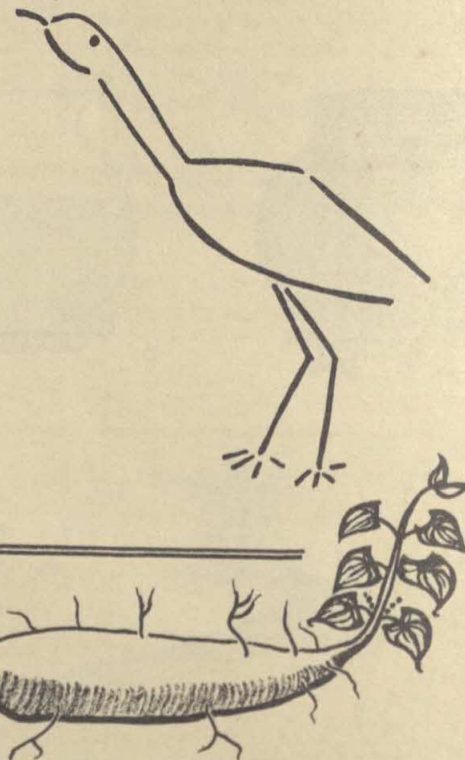
Use your eyes and ears and don't forget the date, time and place you see things.

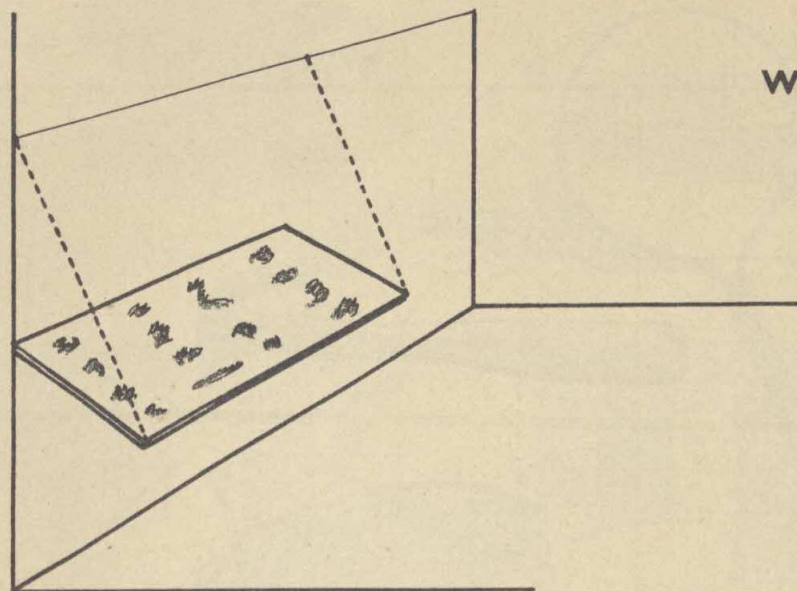
If it is possible, your teacher will take you out and show you how to look at living things and what to remember most. But you will have to write it down yourself. You will need some help in putting it down simply, without using a lot of words.

Here are some ideas for a class Nature Table and how to use elastic bands to hold your collection on to the table.

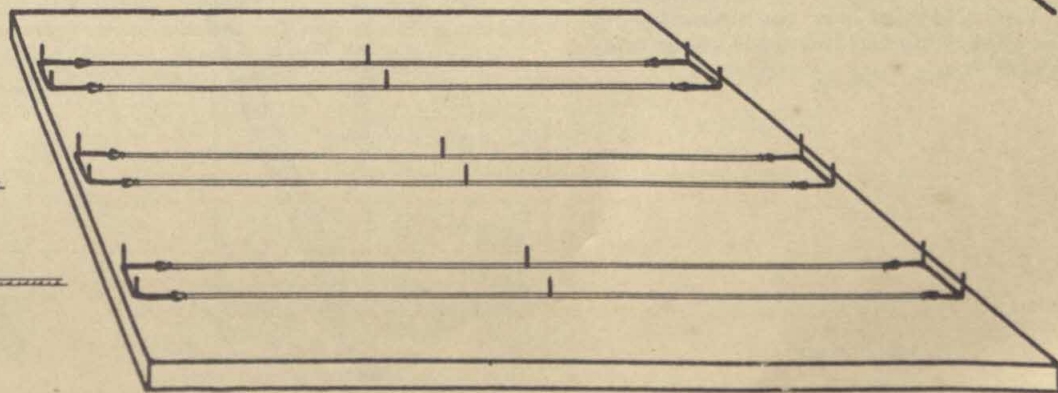
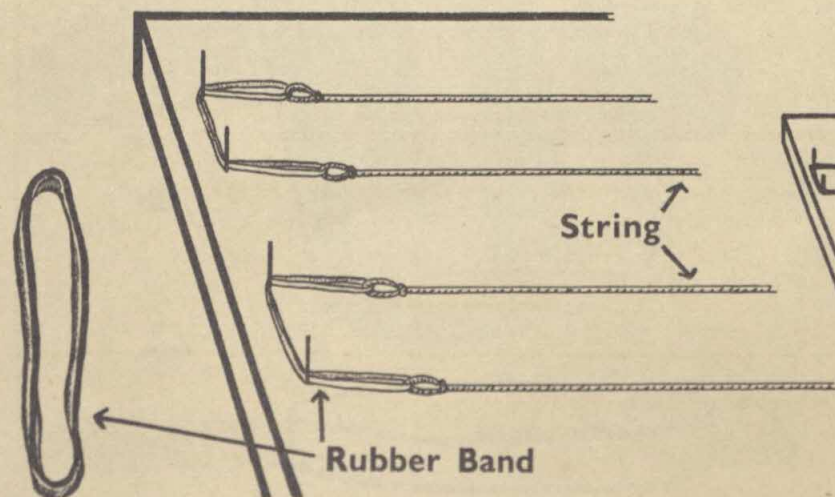
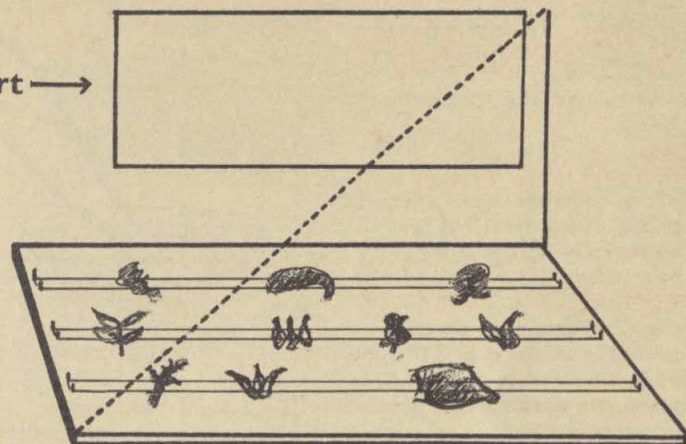
Date	Time	Season	Name(Eng.)	Name(Af.)
2.11.'57	10 a.m.	Dry Season	Cattle Egret	
What it looked like	Large white bird with long yellow legs & long neck.			
What it was doing	Came down slowly without moving its wings. Picked up centipede.			
how growing				
Place	Football field.			
Things near it	Bushes. Goats did not run away			
Other things to say	When it flew away it had a small animal, perhaps to feed its children.			
10.11.'57	4 p.m.	Dry Season	Yam.	YeLe.

Drawings.





Weather Chart →



GETTING READY TO LOOK AT LIVING THINGS

Things to make to help you collect and keep living things

Wire, glass jars, tins of all sizes, cardboard and netting or thin cloth will always be needed for this work. Do try and bring a good supply to school.

To kill small insects, etc., so that they can be kept, you need a 'killing bottle'. This is a bottle with a lid. Halfway down, you make a flat place with wire netting or cardboard with holes in it. To keep it in place, you cut it with two flaps to reach down to the bottom of the jar. The bottom half of the jar is then filled with an insect-killing stuff like D.D.T. liquid. The insect is put in and the lid is put on. The insect is slowly overcome by the insect-killer and dies without being damaged or suffering very much.

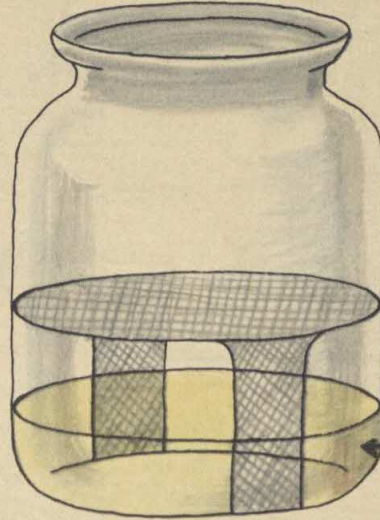
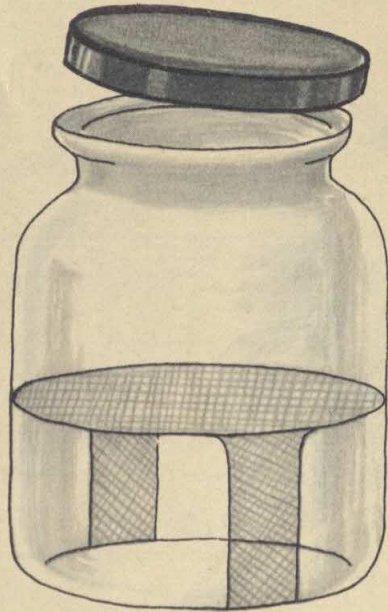
The tins are best used as shown when you want to grow plants in them.

The 'Catching Net' has a handle four feet long and the net is about one foot across.

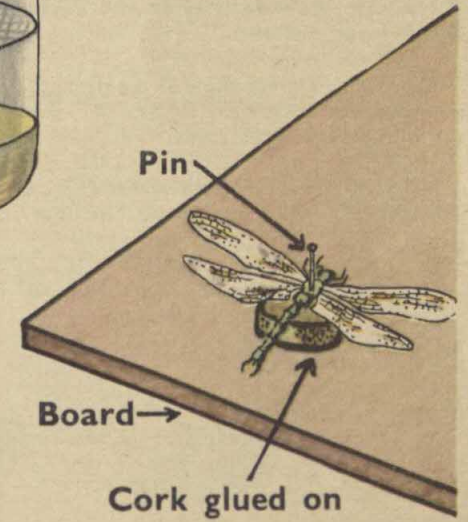
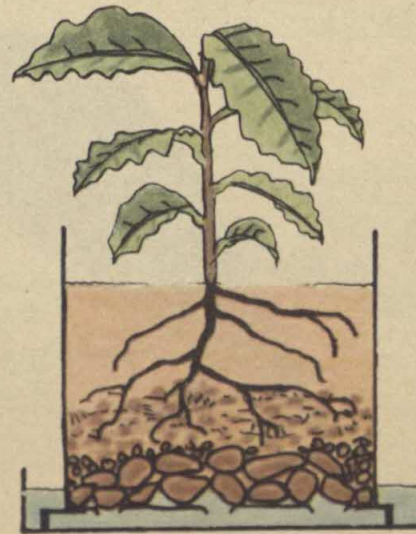
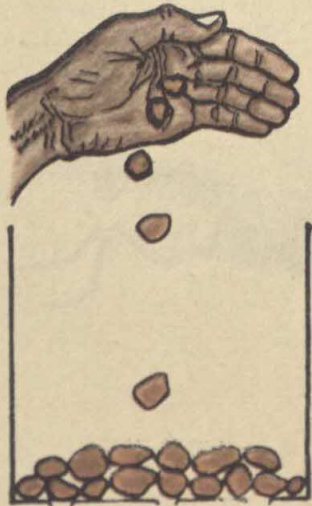
What You Need



Killing Bottle



Insect
Spray



GETTING READY TO LOOK AT LIVING THINGS

What Living Things can do that Non-living Things cannot do

Look at these pictures. They will help to tell you the things all living things are able to do.

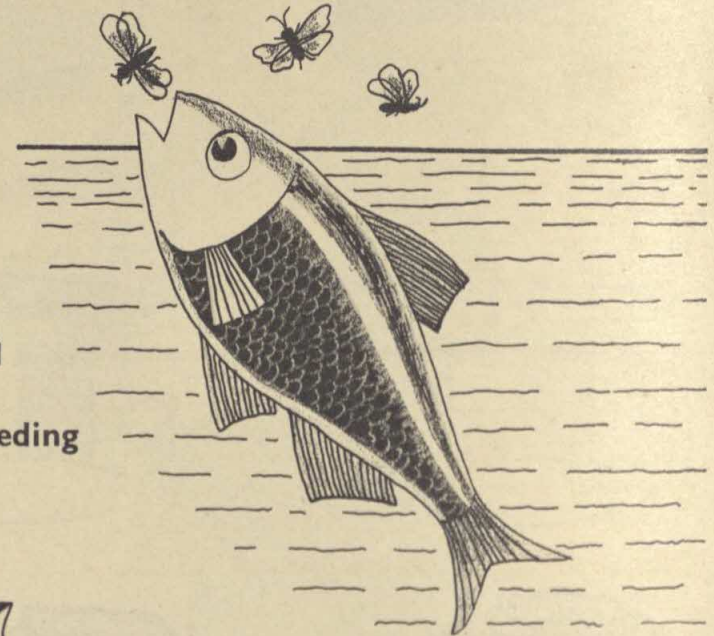
Make a list of four of these.

Do plants take in food and water ?
If they do, how do they do it ? Write
down your answers.

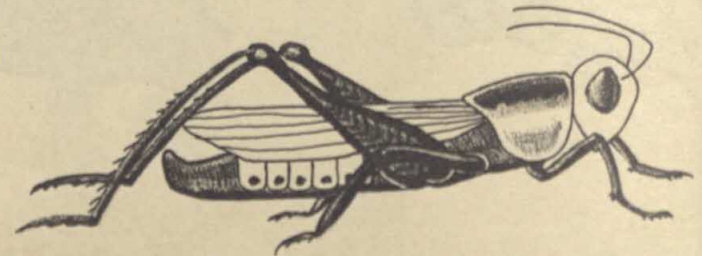
Kill a large insect like a Grasshopper.
Find the 'breathing holes' in its sides. Draw
the insect showing the holes.

Insects can be mounted for the class
Nature Table as shown on the last
page.

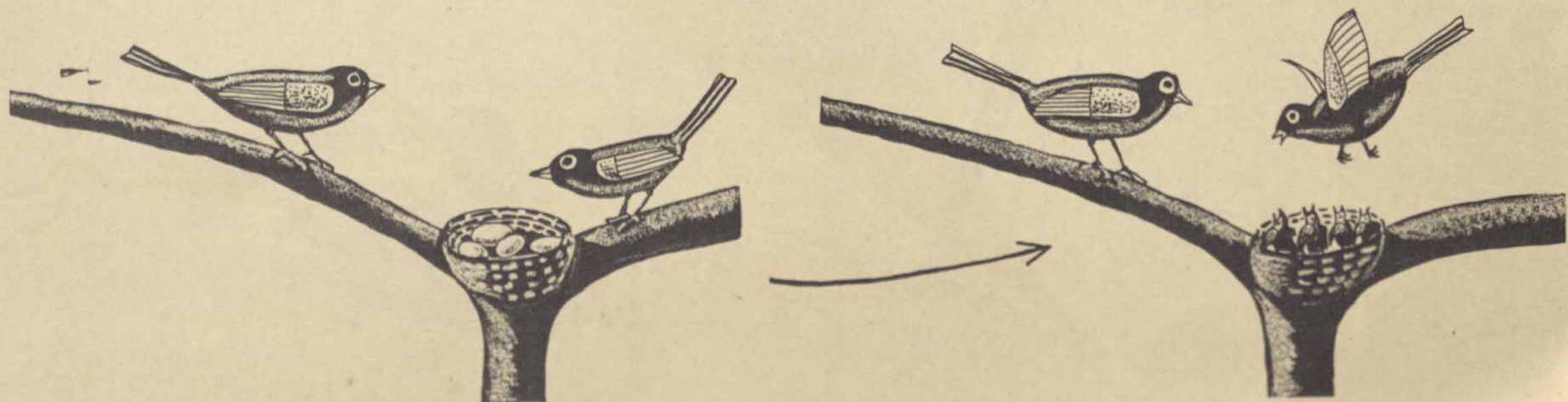
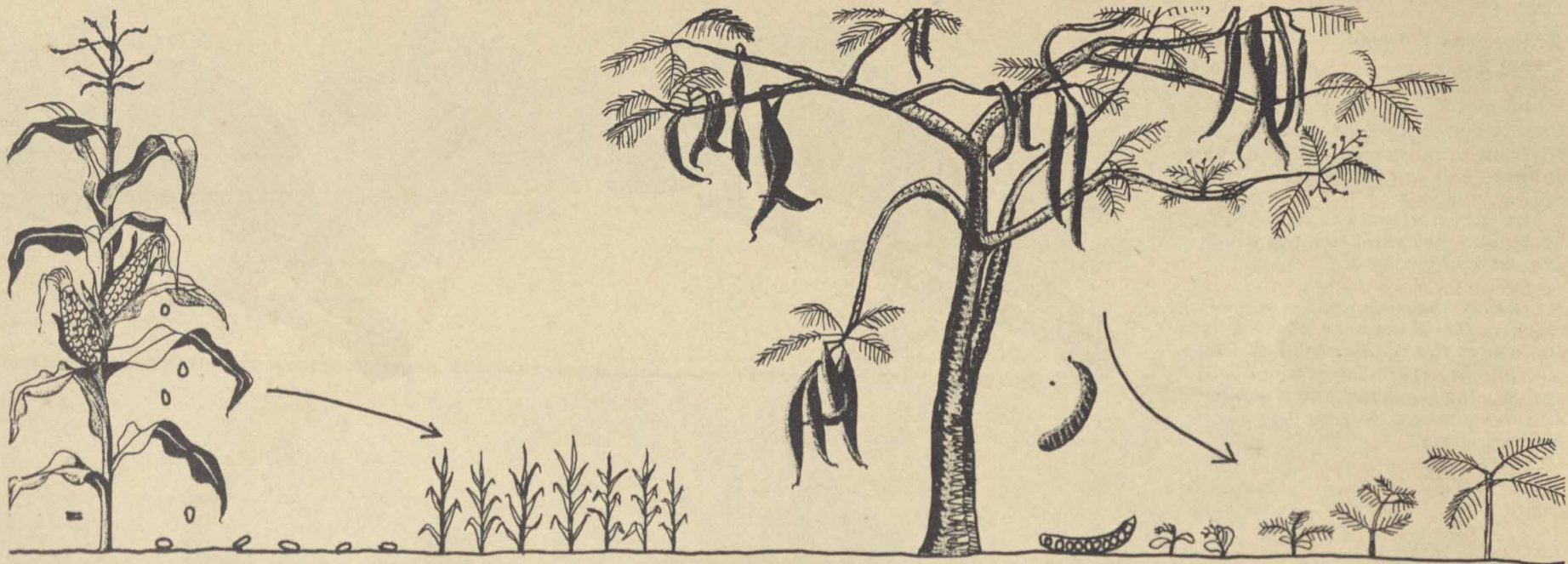
Some breathing holes are marked on the
leaf, but really they are too small to see
without a magnifying glass.



Feeding



Breathing



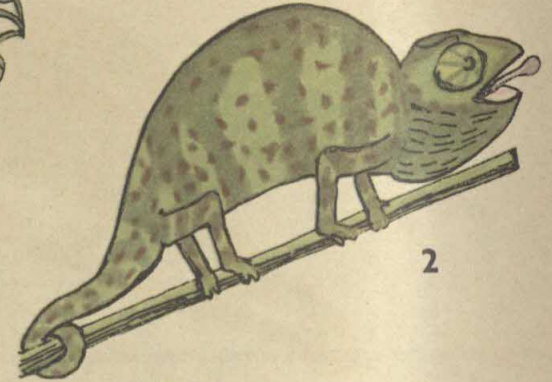
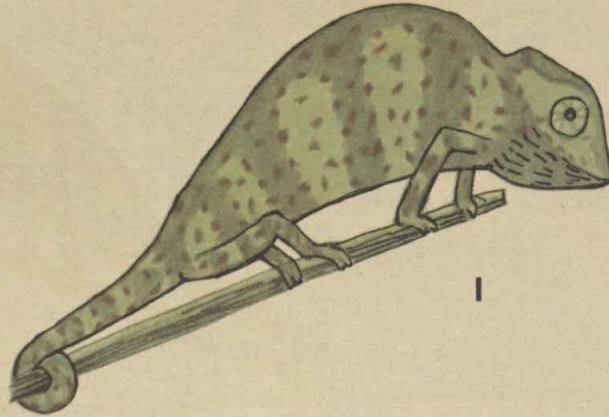
FOOD

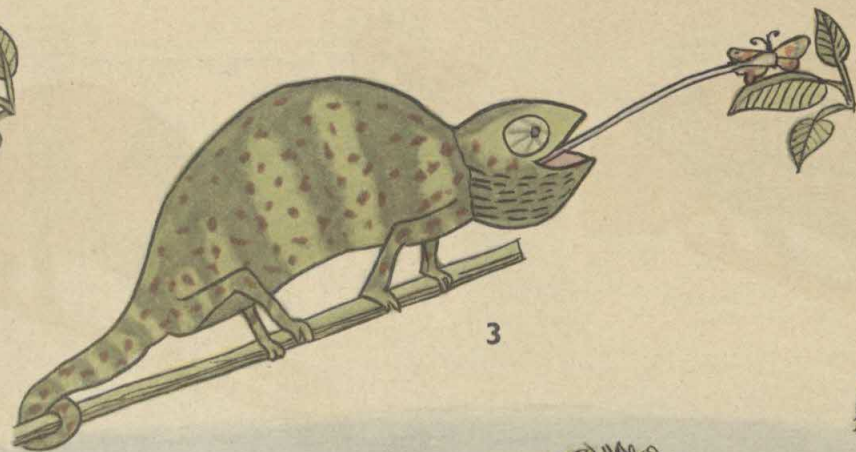
Getting food. Tongues, Beaks and Claws

Pictures 1, 2, 3 and 4 show how the Chameleon catches its food. Write anything you know about this strange animal.

The other pictures show some beaks and claws and tongues which are used to get food.

Look at the beak and tongue of the chicken. Draw the beak. Make a list of the things the chicken will eat. Make another list of the things a dog will eat. During the week watch other animals feeding. Make notes in your Nature Diary.

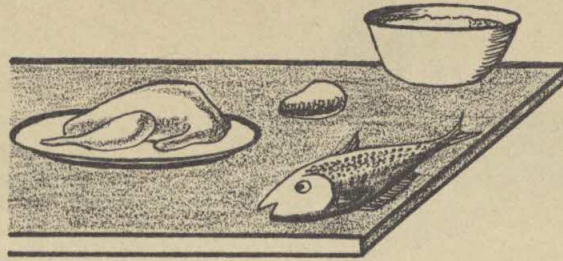




FOOD

Our Food and Other People's Food

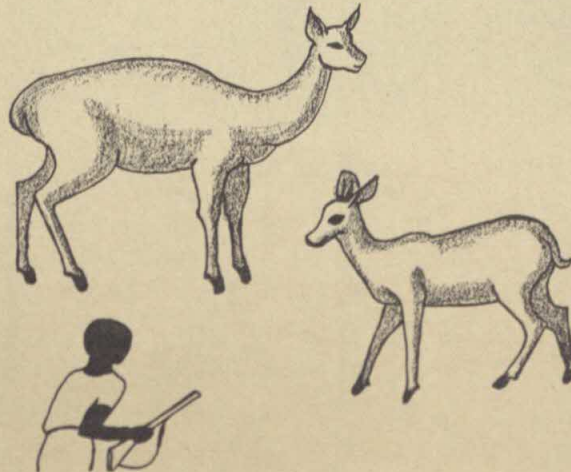
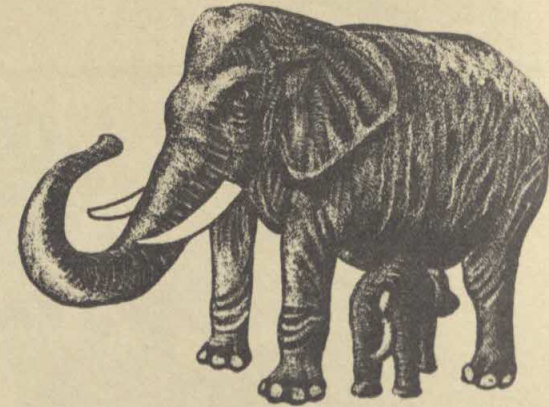
Where does the food on the table come from? What is the woman doing in the picture? Do you know that people eat elephant meat? What are the wild animals at the bottom of this page? Are they good to eat? Write down your answers in your book.

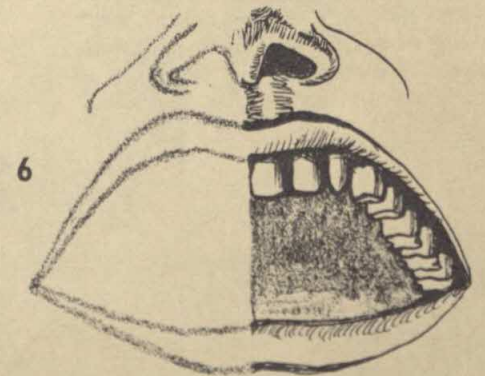
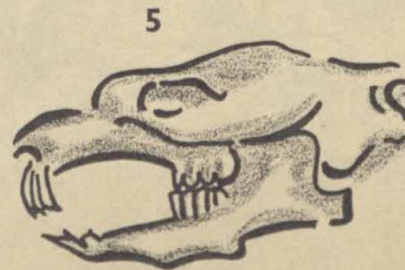
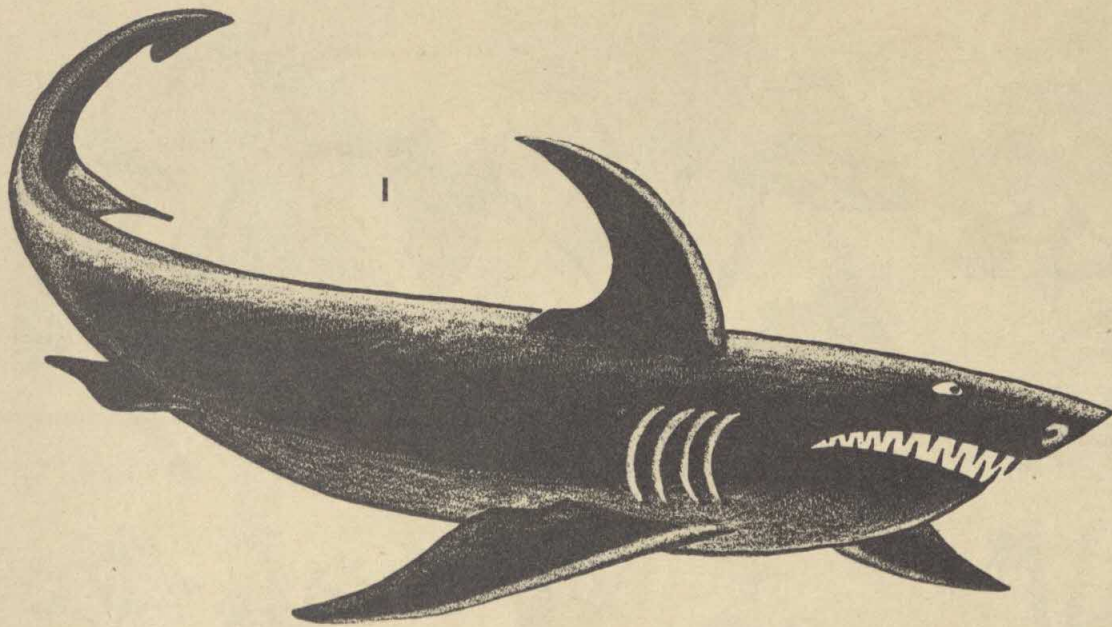


Write a list of animals, including birds and fish, that we use for food. Now write down beside each animal what kind of food it eats. Without plants neither we nor the animals can live.

Draw a picture or make a model of an animal or fish trap. Start a collection of skulls of animals. Look at their teeth and see how they are suited to the food they eat.

Look at the teeth of the next boy or girl. Pick out three kinds of teeth with the help of picture 6. Make a drawing of each kind and say what it is specially used for.





FOOD

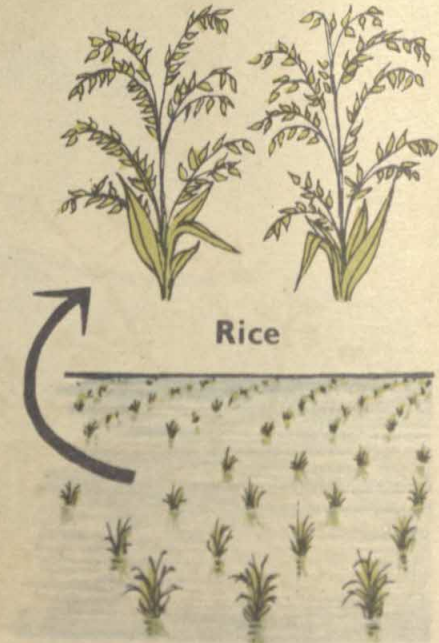
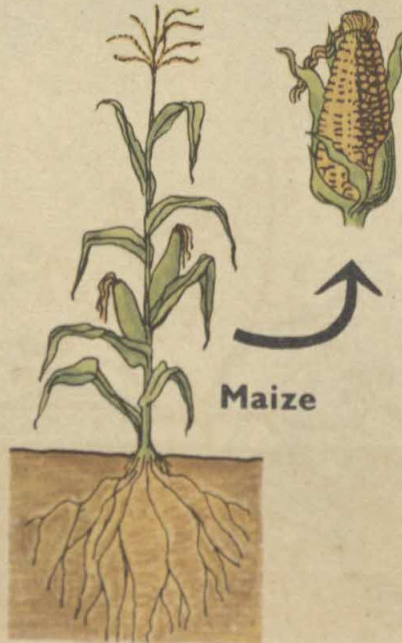
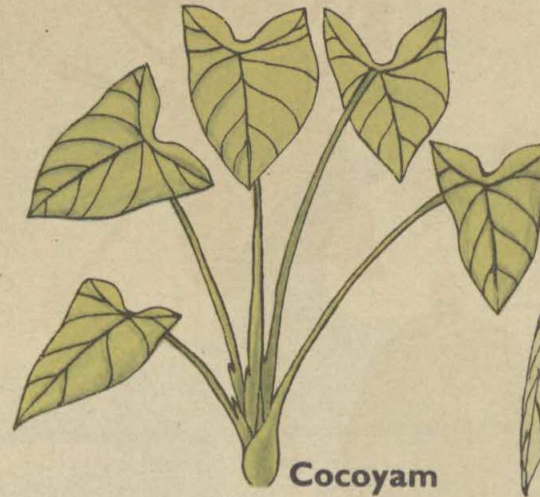
Plants We Use For Food

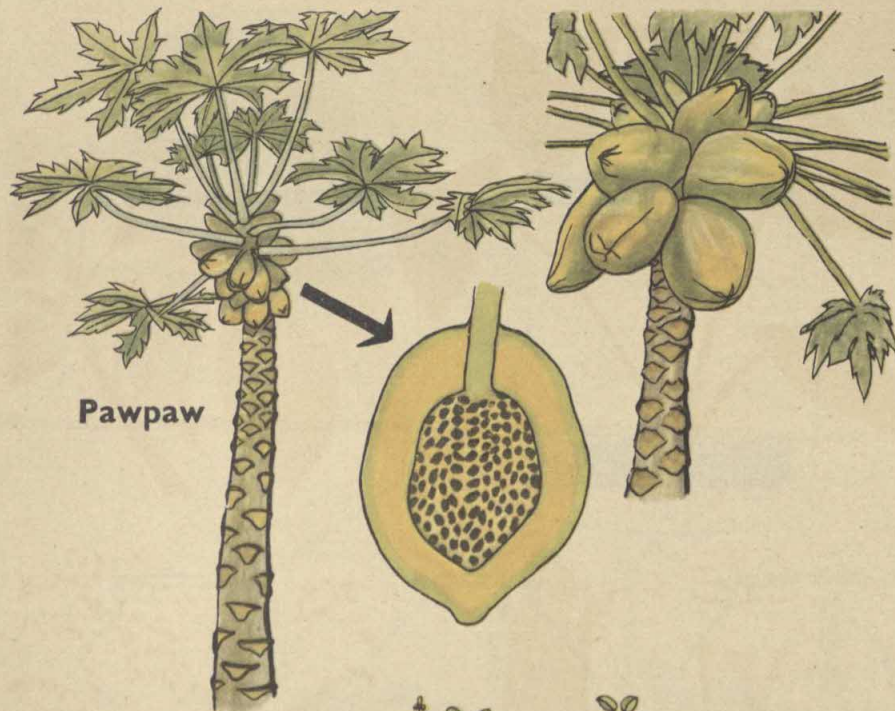
Make a list of the kinds of food we eat.

Does any of your food come from plants shown here? Your teacher will tell you about any that do not grow where you live.

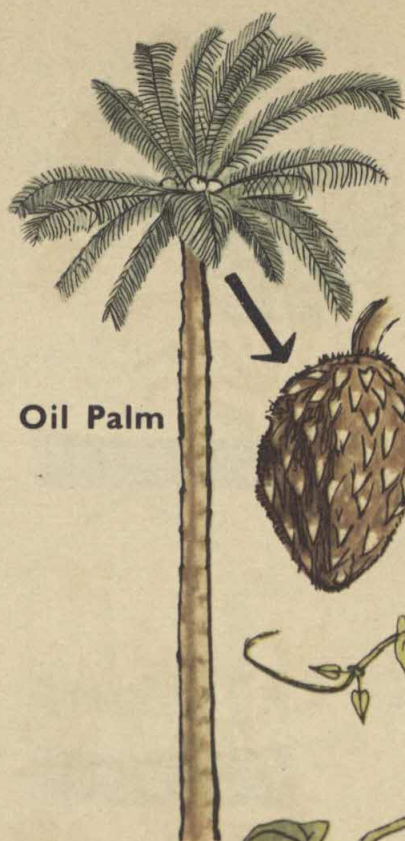
Collect the leaves, and the parts we eat, of three plants. Your teacher will arrange that each group collects different plants. If it is seed-time for any of them, bring the seeds too. Make careful drawings of your collection.

Find out all you can about growing these things from the farmers. If possible, the class should visit farms.





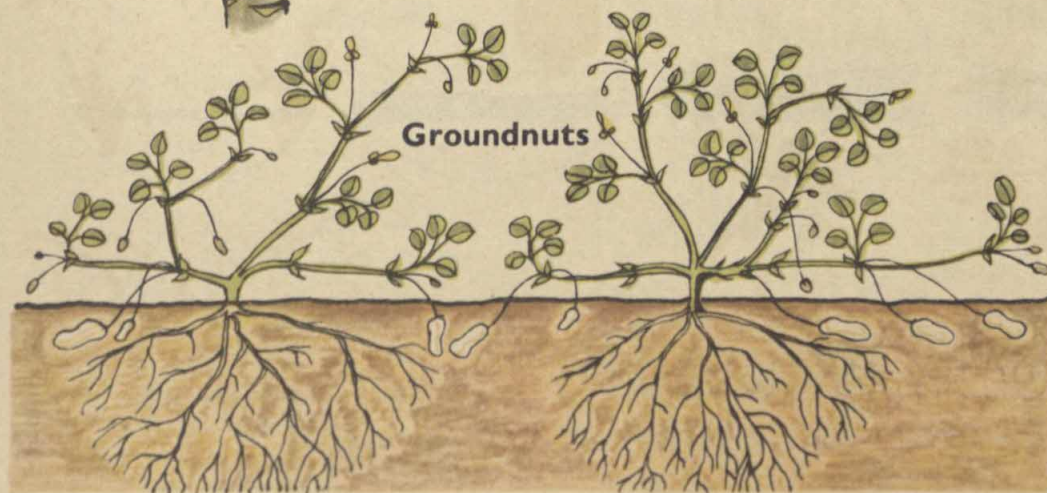
Pawpaw



Oil Palm



Banana



Groundnuts



Yam

FIRE, COOKING AND KEEPING HEALTHY

Fires Need Air, and We Need Air

Why does the wood in picture 2B not burn?

Why does the wood in 3 take a long time to burn?

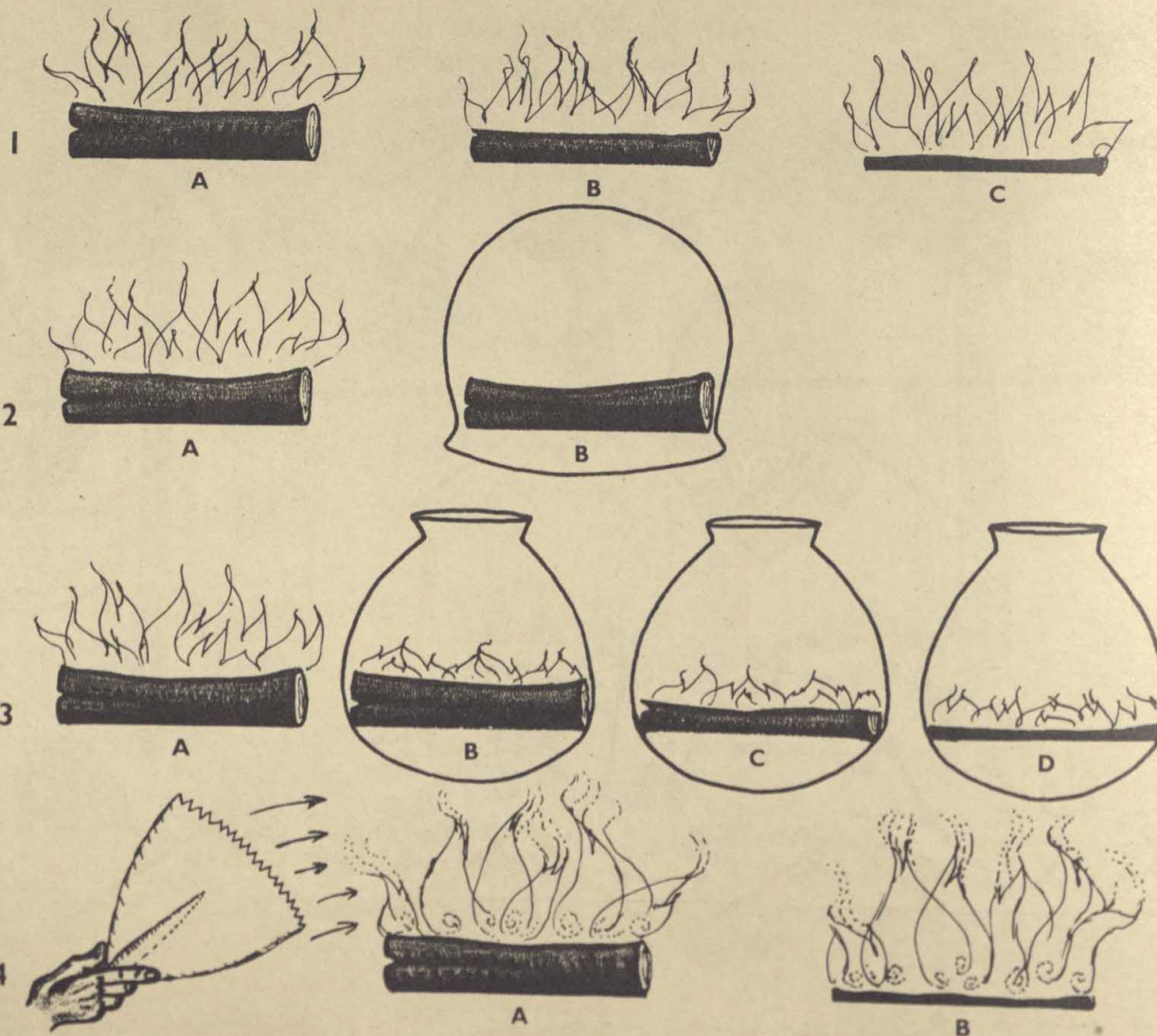
Why does the wood in 4 burn faster than in the other pictures?

Write your answers to these questions.

What difference can you see between houses X and Y?

Why is the man in X having a bad night? Why is the man in Y full of energy in the morning?

Remember when many people are in a room the air is used up very quickly. The air gets bad and people have headaches and feel tired.



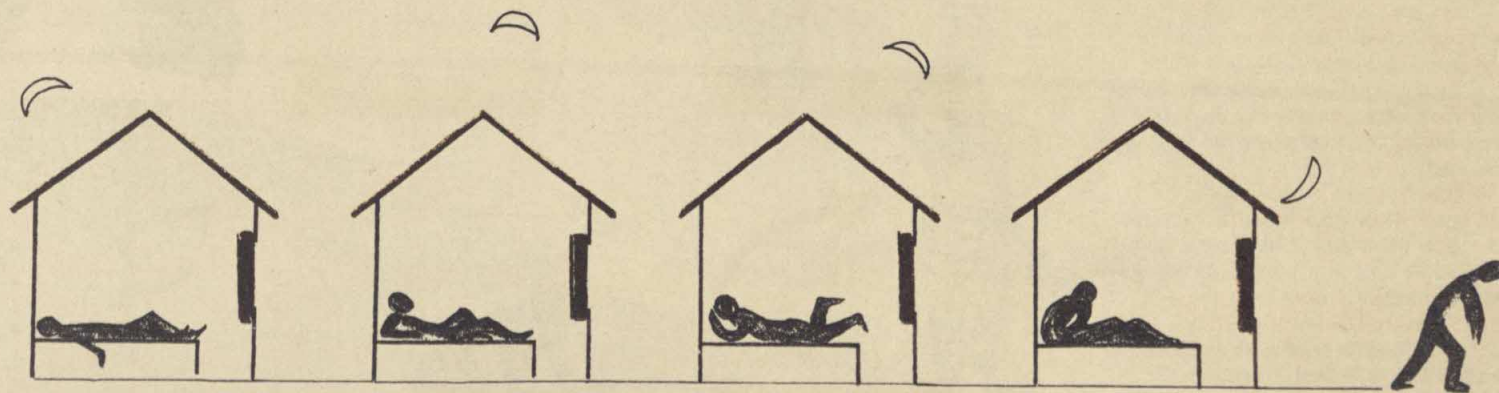


Fresh air is breathed in.
The 'burning' part of the
air is used up.

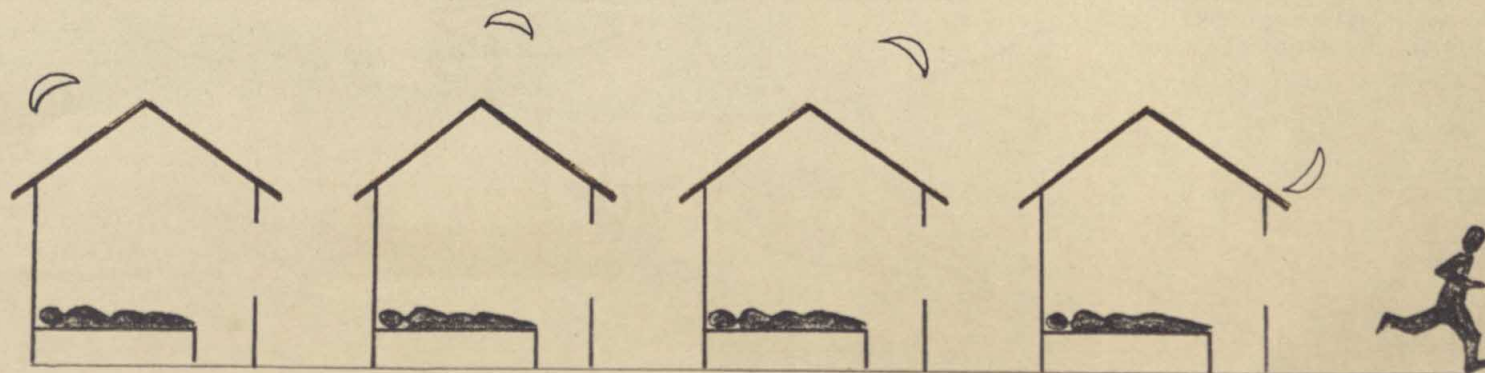


The 'non-burning' part of
the air is breathed out
again with some 'waste'
air from our bodies.

X



Y



FIRE, COOKING AND KEEPING HEALTHY

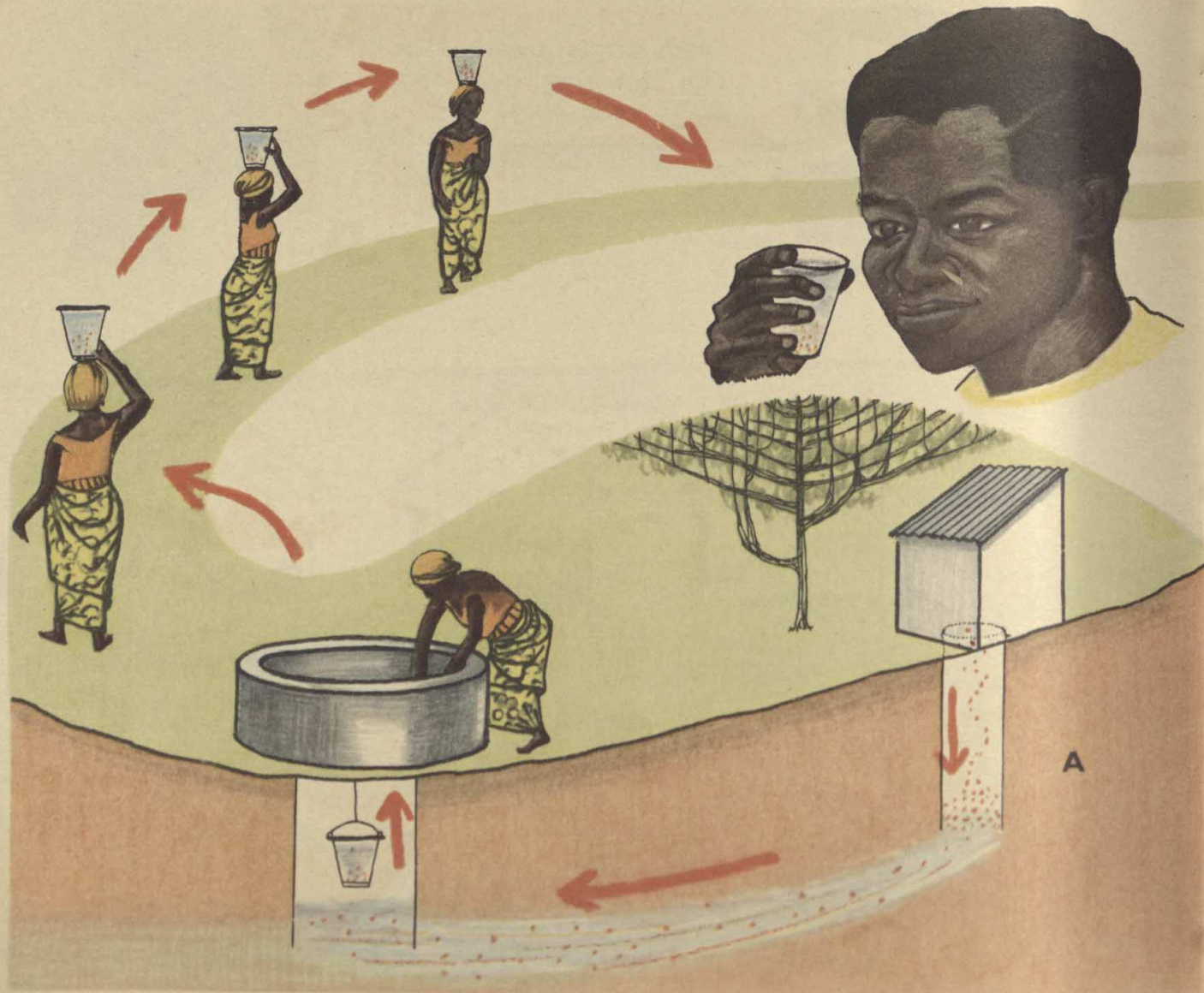
Why We Need to Cook Food to Keep Healthy

These pictures show why we should boil our drinking water and cook most of our food. The 'seeds of sickness' which make you ill are so small you cannot see them, though they are very powerful. In the pictures we have put in red marks to show where they are.

They come from people who are ill, and are easily carried in water, even in wells and often in streams. Follow the arrows in the picture and you will understand.

Why is it wrong to have a latrine higher up than a well? Write a note in your book and say where latrines should be put.

Look at B and see how the 'seeds of sickness' can be killed. Look at C. How else can sickness be carried to you? Write your answer down and think of two things we can do to prevent food being dangerous to us.

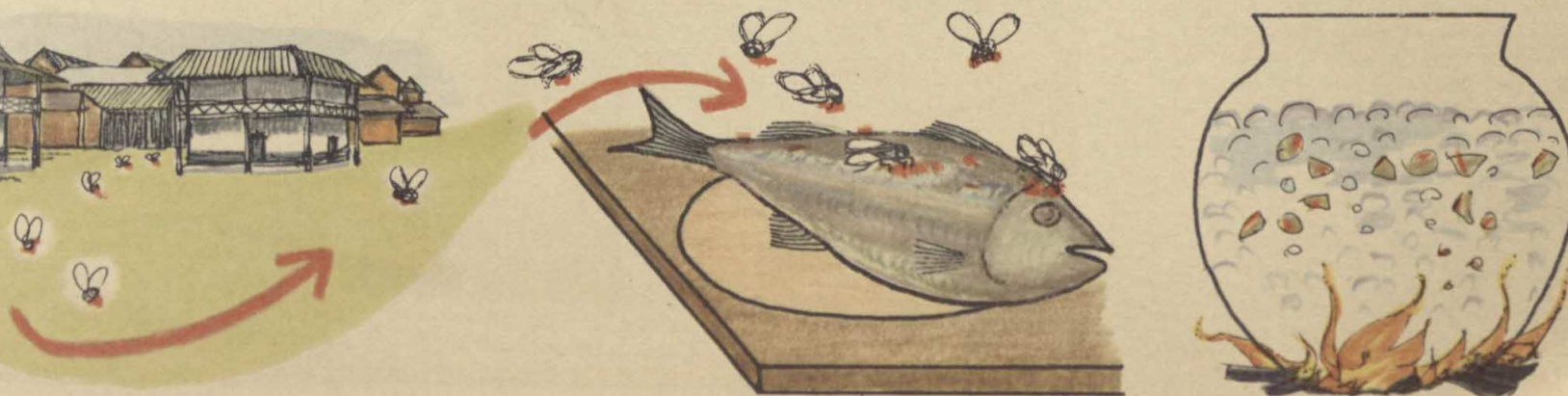




B



C



PLANTS GROW FROM SEEDS

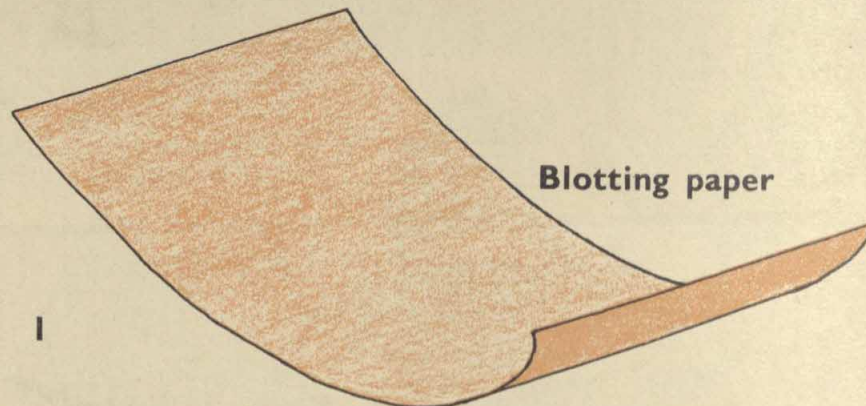
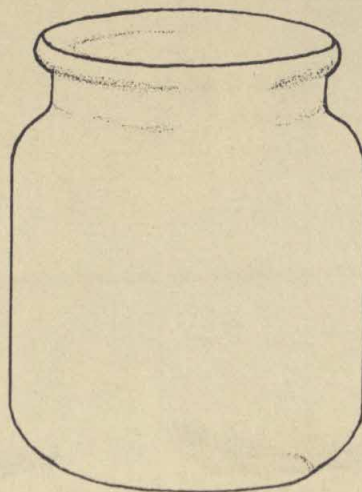
Watching Seeds Grow

Each group needs ten seeds—bean, maize, ground nut or castor oilseed. Different groups should have different seeds. Before the lesson they must all be soaked for about four hours.

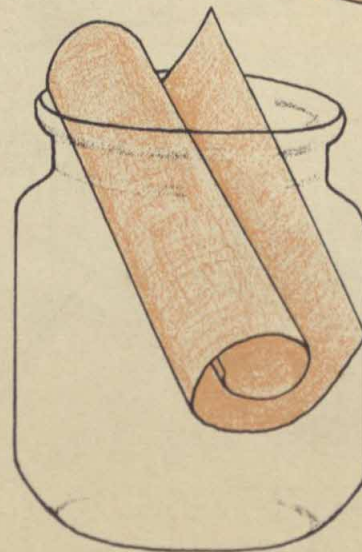
Put four of the seeds between the blotting paper and the glass of the jar. See they are in different positions. Some may be upside down. Pour in about an inch of water. During the week add water from time to time. See no ants get into the jars.

Plant the other six in jars as shown on the opposite page. Note number 2 must always be kept filled with water, and number 4 kept in the dark.

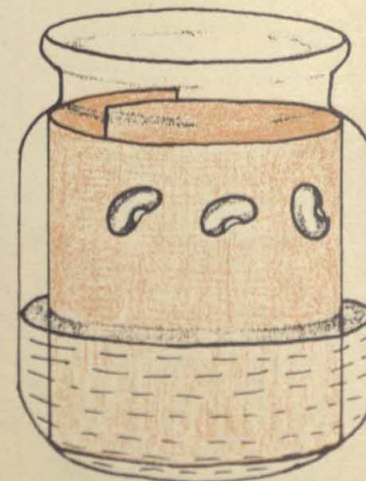
By next week you should see if these pictures are right or not. In any case you should then write down in your book what has happened to your seed.



1



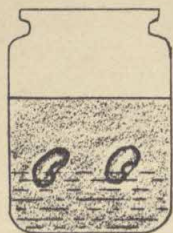
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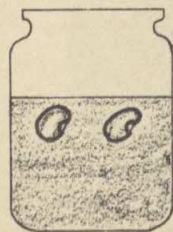
3



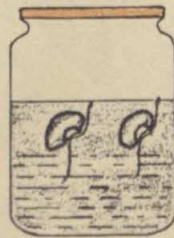
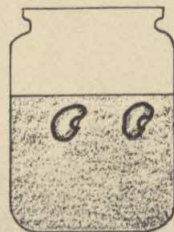
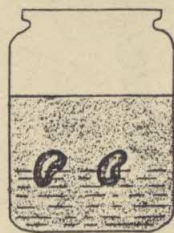
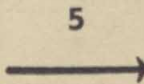
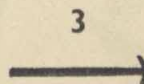
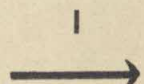
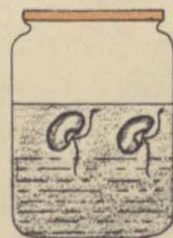
Seeds too deep in soil



No water



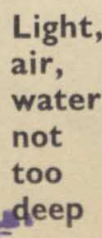
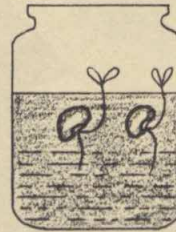
No air



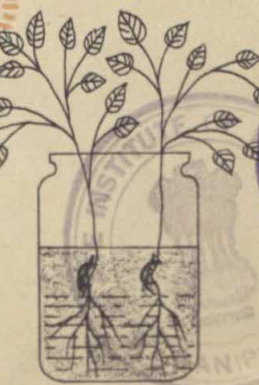
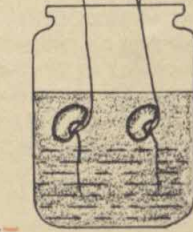
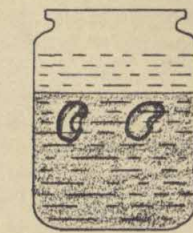
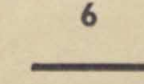
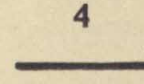
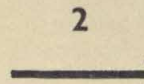
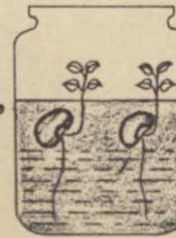
Too much water



No light



Light, air, water, not too deep



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PLANTS GROW FROM SEEDS

Pressing Flowers, Grasses and Small Plants

To preserve your plants and seeds you need to press them. You need lots of newspaper, some brown paper and sewing thread.

Pictures 1, 2, 3 and 4 show how the pressing is done.

After a week the plants will be dry and will then last. Some of the flowers should be opened out or cut in half to show all the parts. When they are pressed they can be put into a brown paper book. See 5, 6 and 7. It should be a big book, about twenty inches long.

The other pictures show different ways of fastening the flowers and grasses and plants in the book. Sello-tape is very useful, but sewing them is nearly as good. You can perhaps start the book next week.



1



2



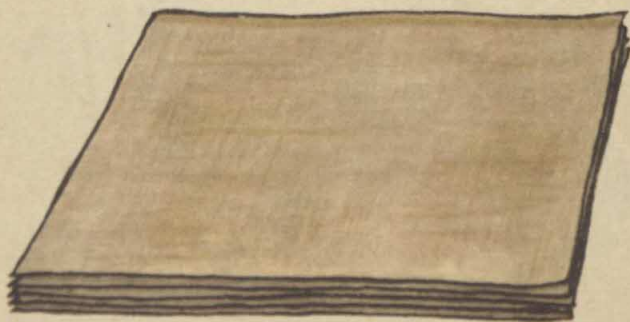
3



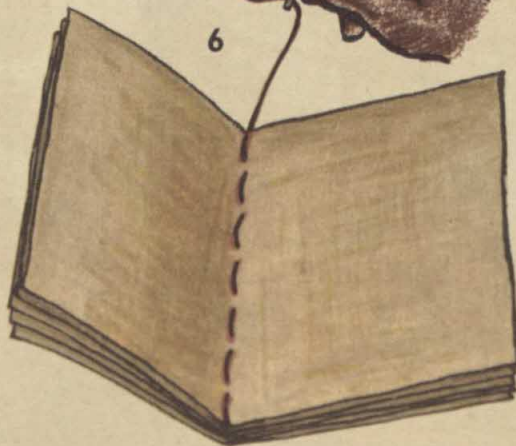
4



5



6



7



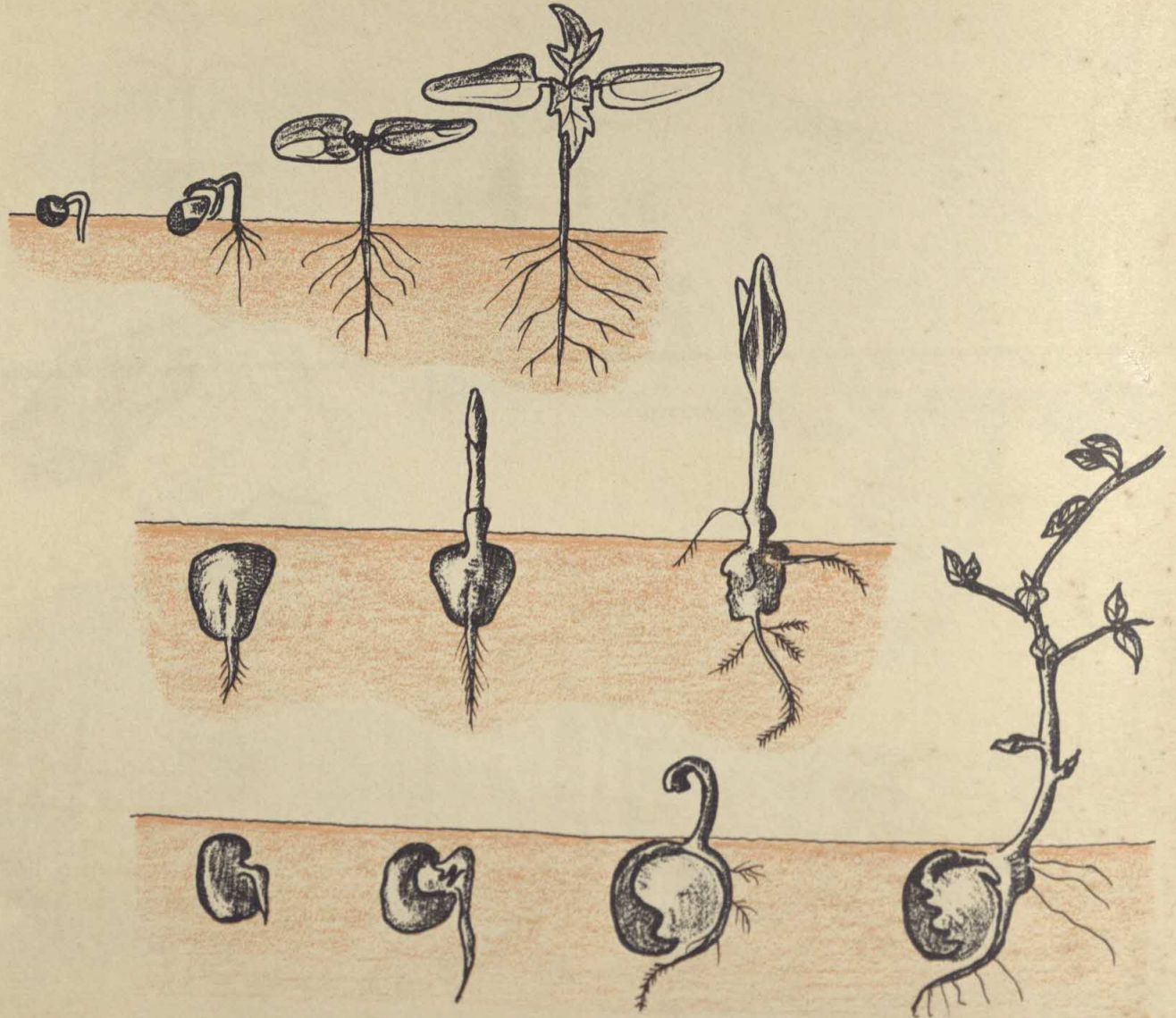
PLANTS GROW FROM SEEDS

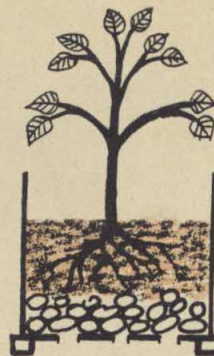
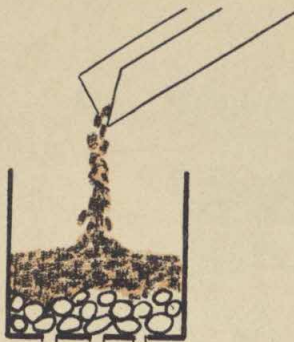
The Young Plant. How Plants 'drink' Water

When your seeds have grown into young plants they must be planted in tins or pots. Before you do so, draw each different kind in your book. Write down the difference between each kind of young plant the class has grown. Divide your writing into one piece about the roots, another about the stem and another about the leaves.

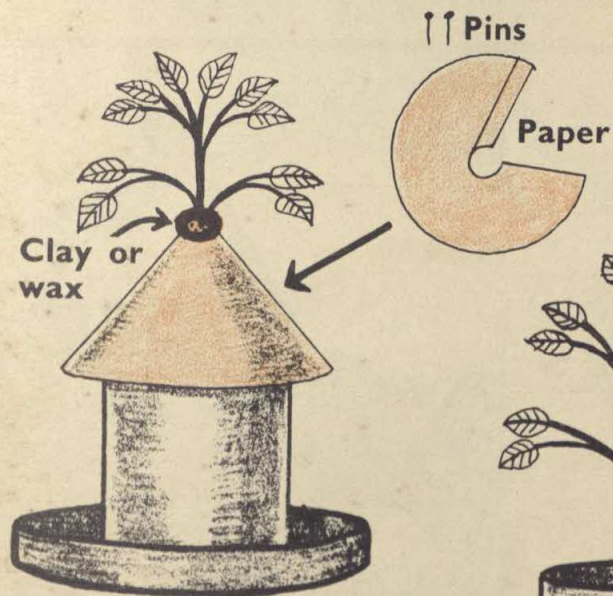
On the opposite page is a way of finding out whether the leaves or the roots 'drink' the water. Each group needs two young plants. They are watered regularly, one on the leaves only and the other through the soil and roots only.

Remember later to write down what happens.

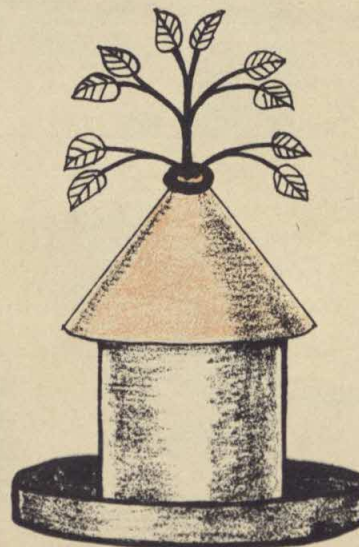
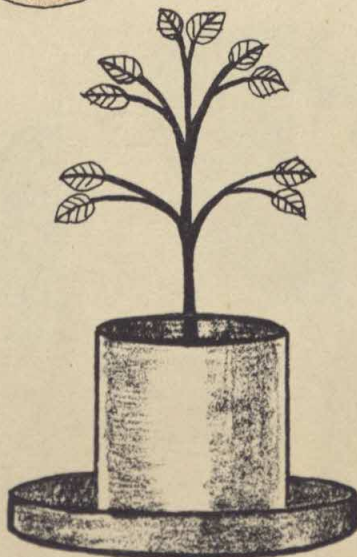




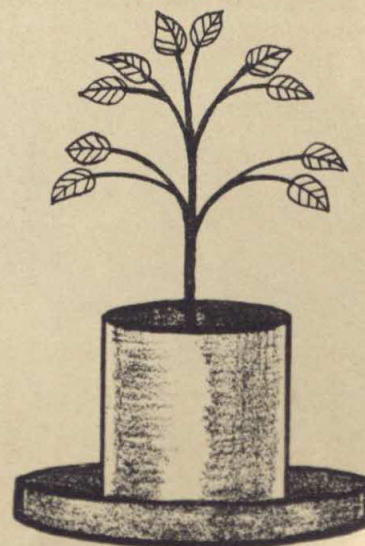
1. Planting
the two
plants



2. Covering the soil
in one pot.



3. Watering both.
How will they grow?

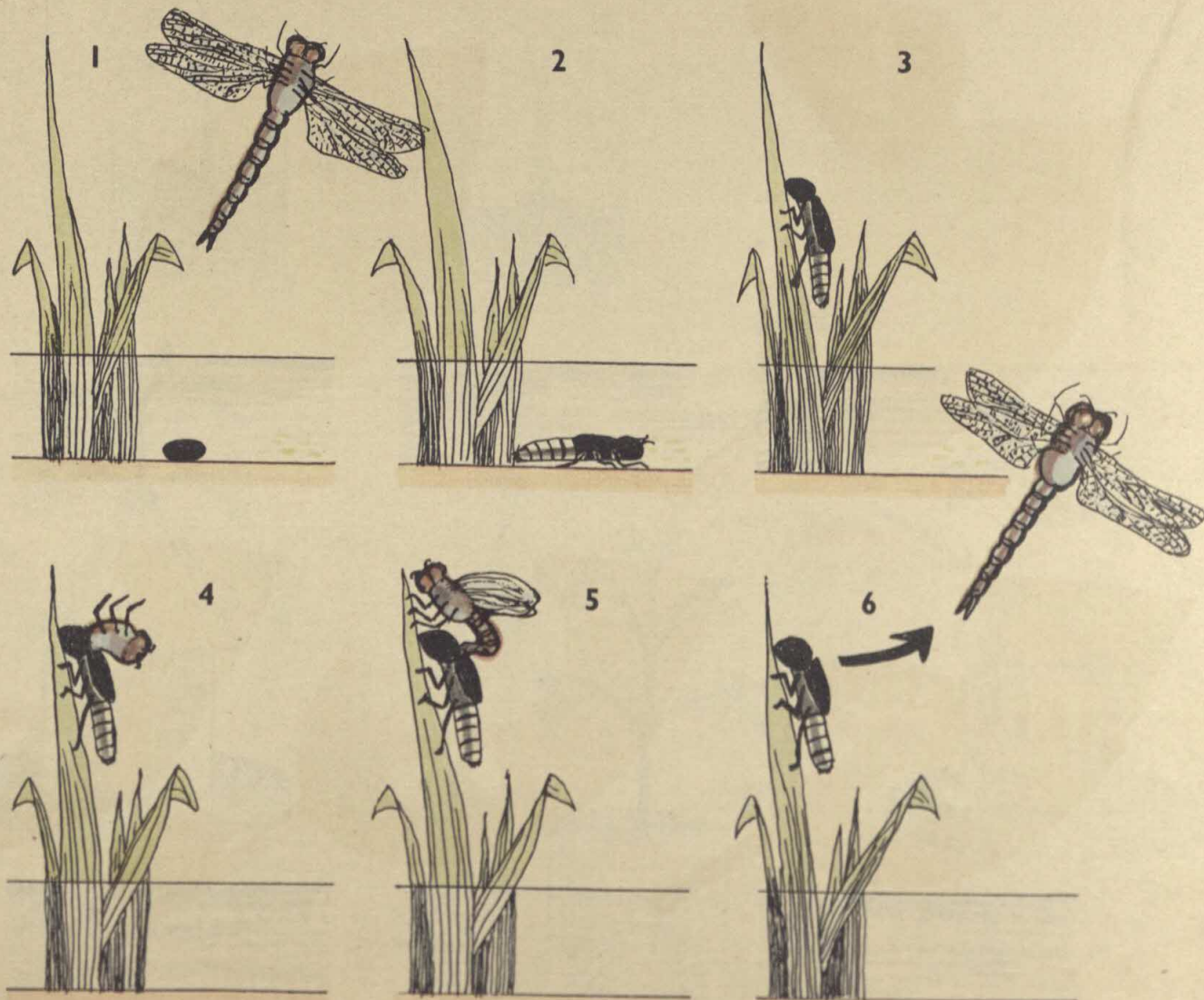


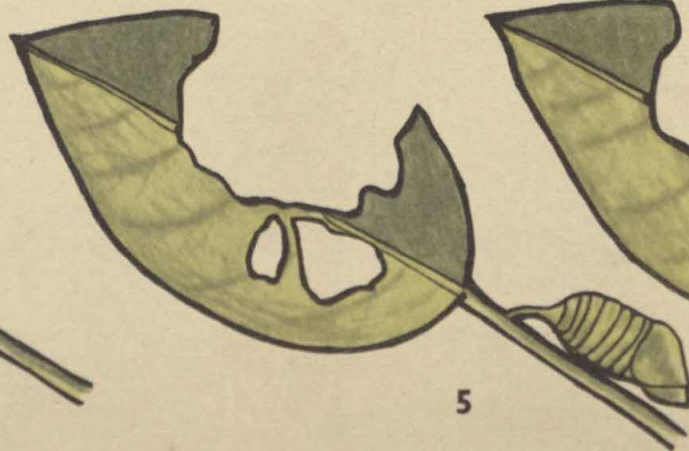
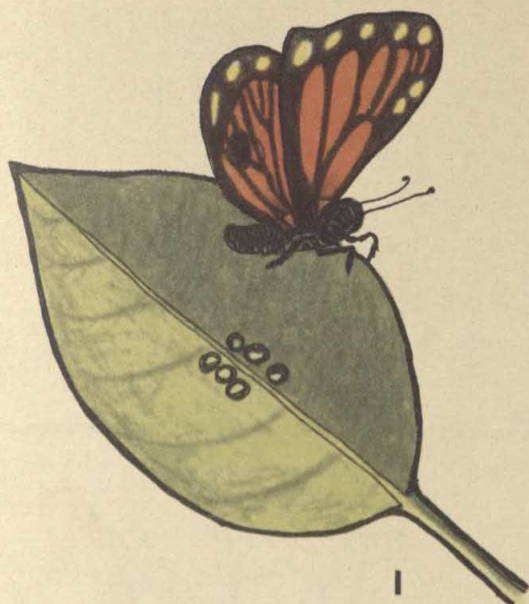
ABOUT ANIMALS

Animal children that change when they grow up

For this lesson you should bring different kinds of caterpillars, butterflies and moths or dragon flies. Some can be killed in the 'killing bottle'. You should also try very hard to find their eggs and the 'pupa' or halfway stage between caterpillar and the butterfly.

Draw the insects you have brought, with the eggs, caterpillar and pupa (if possible). Write down the story of how they change from eggs to the insect that flies away. The six pictures on each of these pages will help you.





ABOUT ANIMALS

Keeping Insects and Small Animals

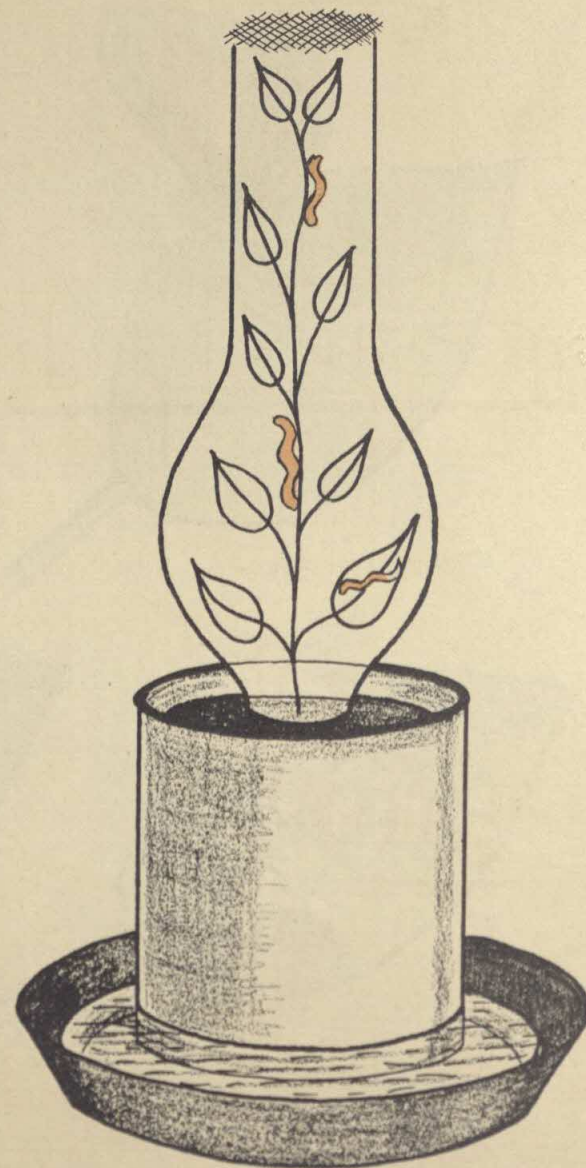
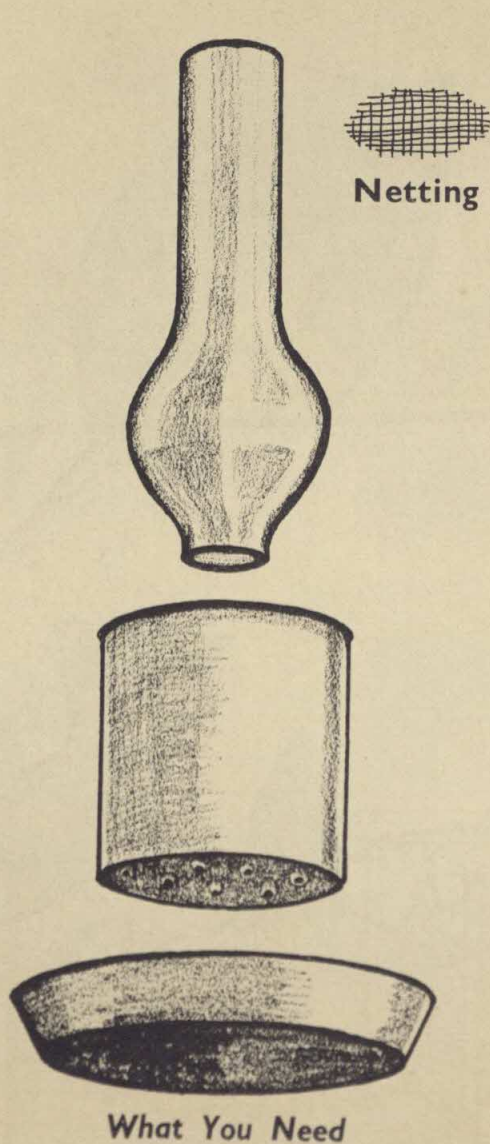
Pictures 1 and 2 show you how to make a place to keep caterpillars, stick-insects etc.

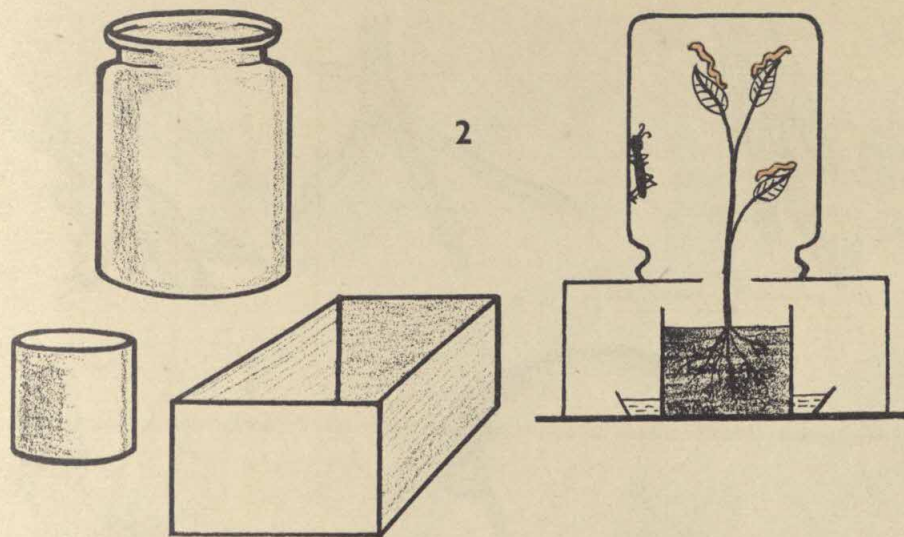
Picture 3 shows how to make a glass-fronted cage to keep small animals for a time. Don't forget food and especially water for them.

Picture 4 shows how to use a bowl and some wire netting to keep frogs and snakes and water animals for a short time.

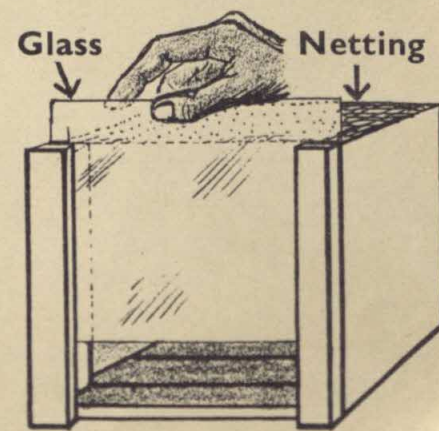
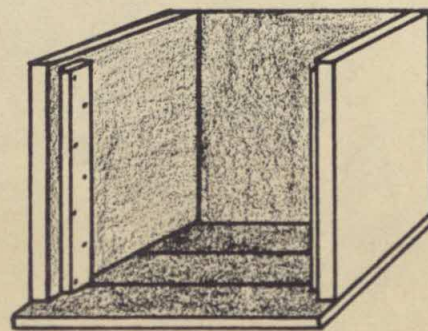
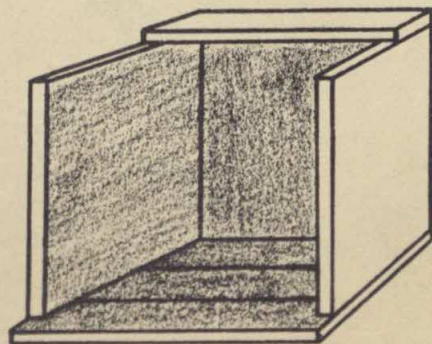
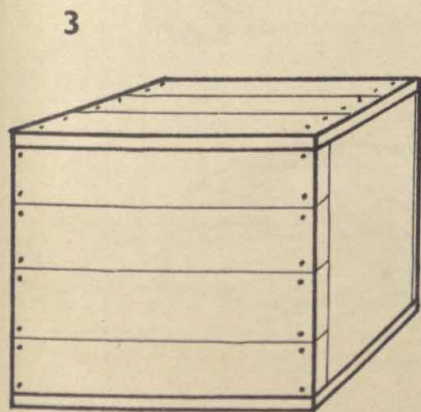
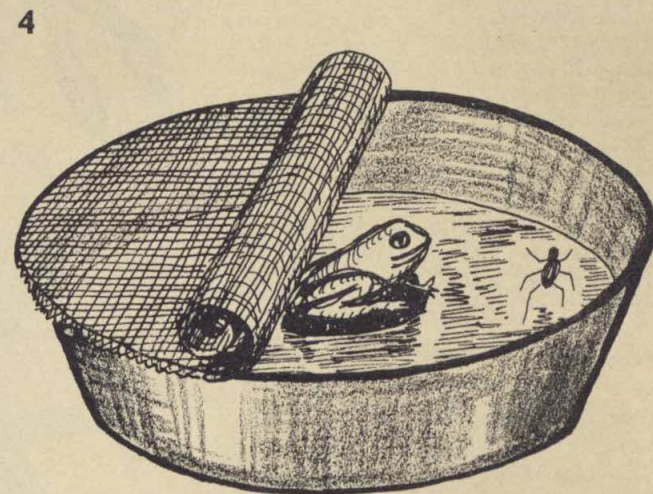
You will probably make these things for the class in large or small groups.

Help your teacher by bringing all the things needed in time.





What You Need



ABOUT ANIMALS

How to look at Animals

These are some of the questions you should try and answer about them. How long and how tall is it? Is the head separate from the body? Is the body divided into separate parts? Is it made up of many divisions? How many legs has it? How many joints in the legs? What kind of feet has it? What kind of mouth? What kind of teeth and eyes? What kind of skin? If it has wings, how many? What are they made of? What shape are they?

Your teacher will suggest other questions you may answer about the animals you are able to have a look at. In your books, answer some of these questions about live animals you know. These pictures are to help you draw what you see, they are not for you to copy.





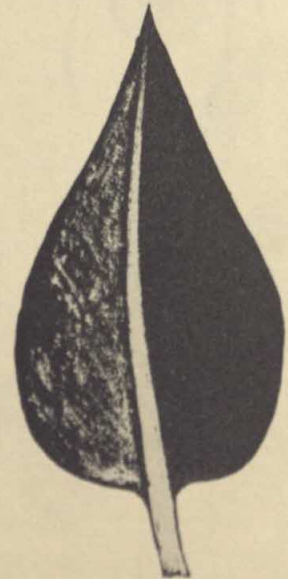
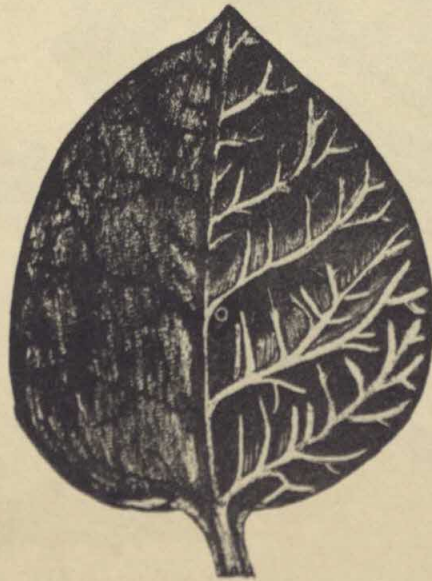
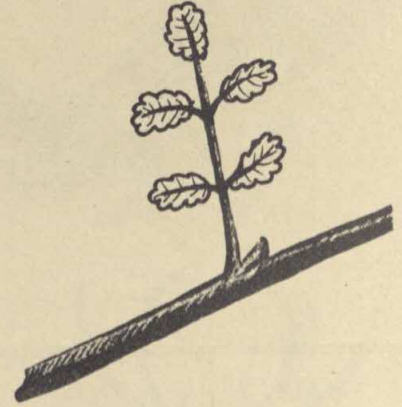
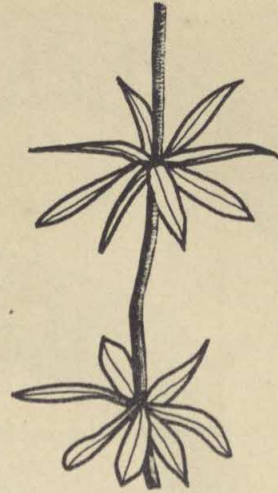
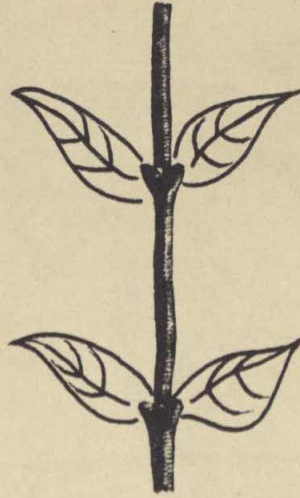
MORE ABOUT PLANTS

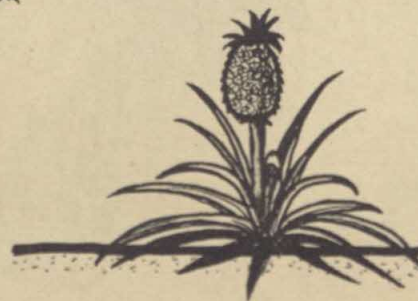
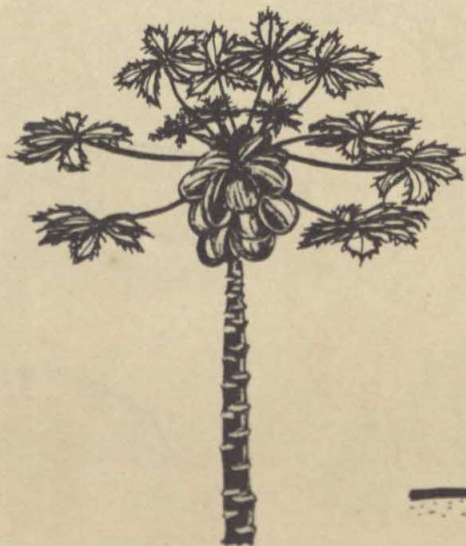
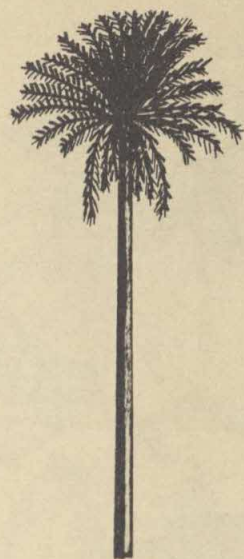
Drawing Trees and Large Plants

The pictures here are to help you to see some of the differences between kinds of leaves, and the look of the larger plants.

Look back at your collection of pressed leaves and also collect some fresh ones. Draw all the different kinds you have and try to put the name of the plant by each one.

Perhaps the class will be able to go out and draw some of the larger plants and trees.





MORE ABOUT PLANTS

Seeds come from Flowers

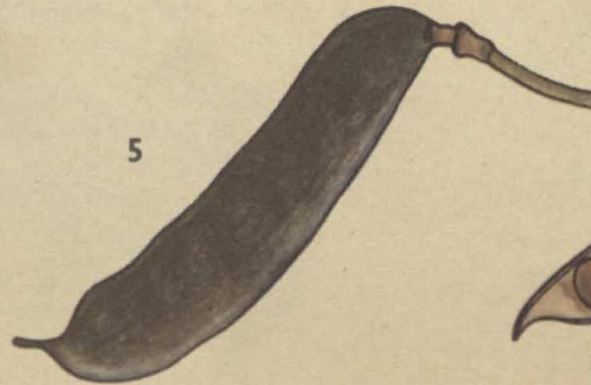
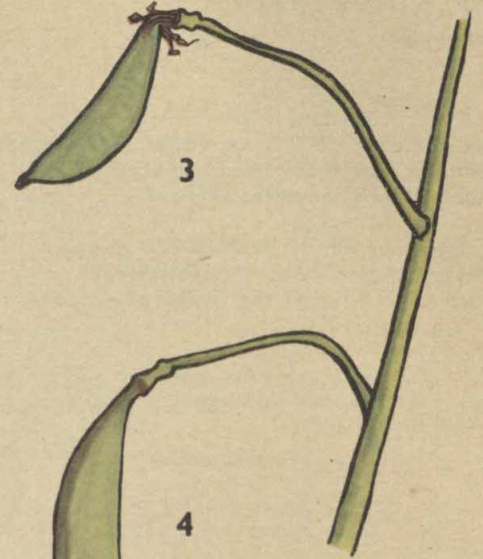
Here are two plants. Red Pepper and Pride of Barbados. See if you can find these near school and bring branches to the class.

Notice how the part of the plant that is in flower slowly changes to the part that has the seeds in it. From each of these plants, see if you can collect all the six stages shown in the pictures.

Write six sentences to say where seeds come from.



Pride of Barbados



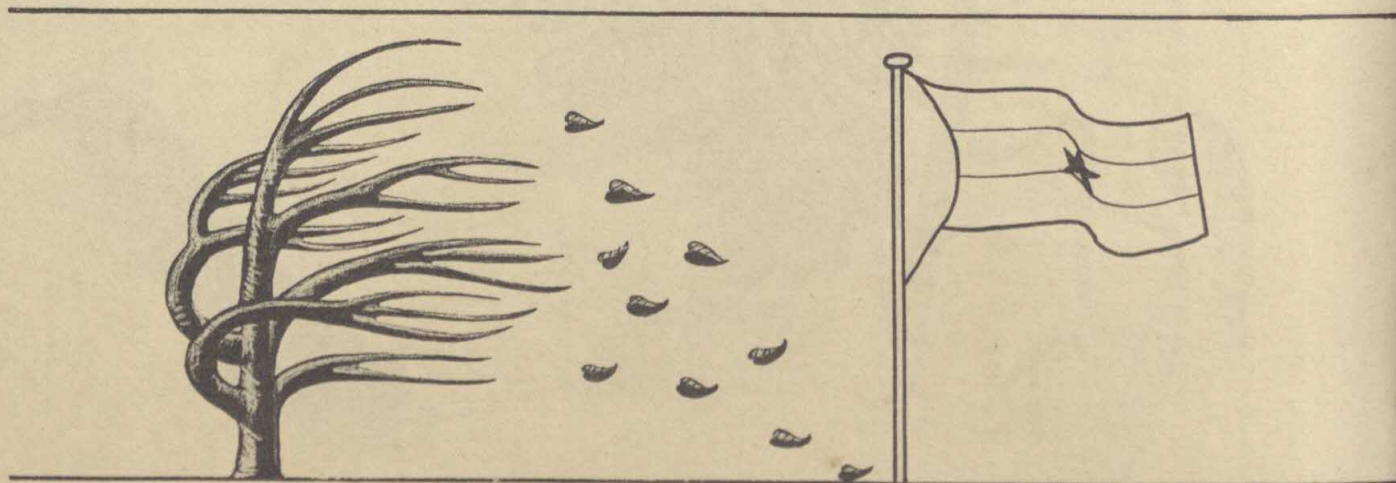
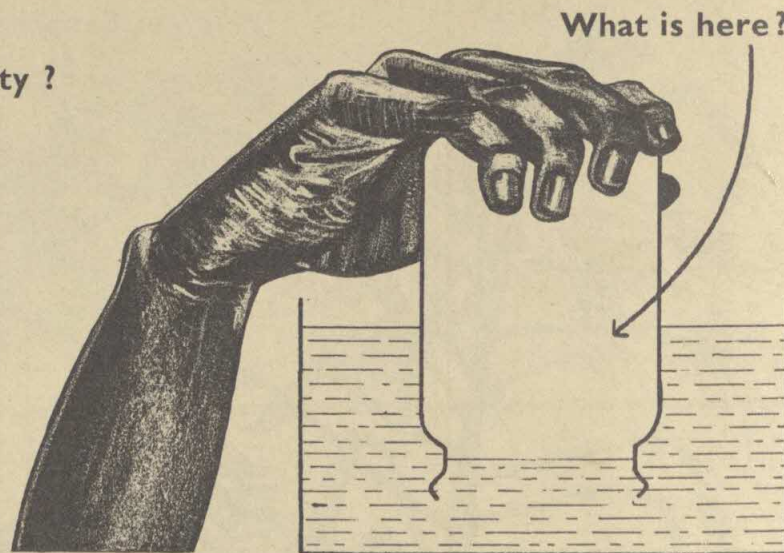
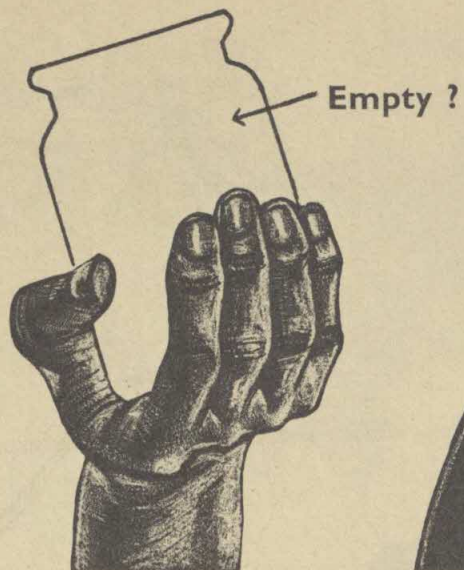
AIR AND WATER

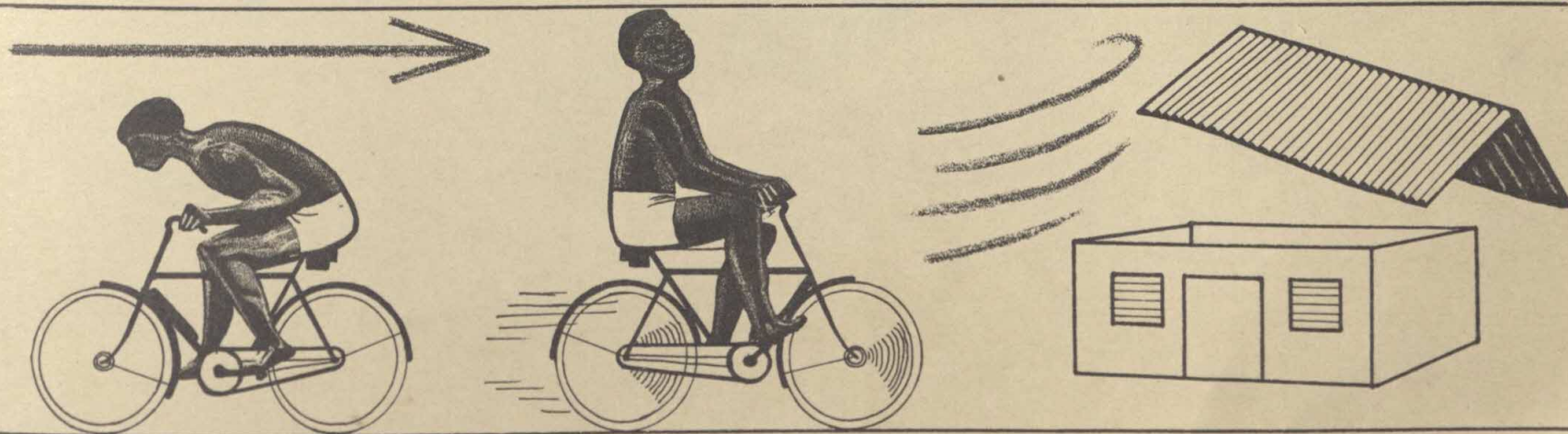
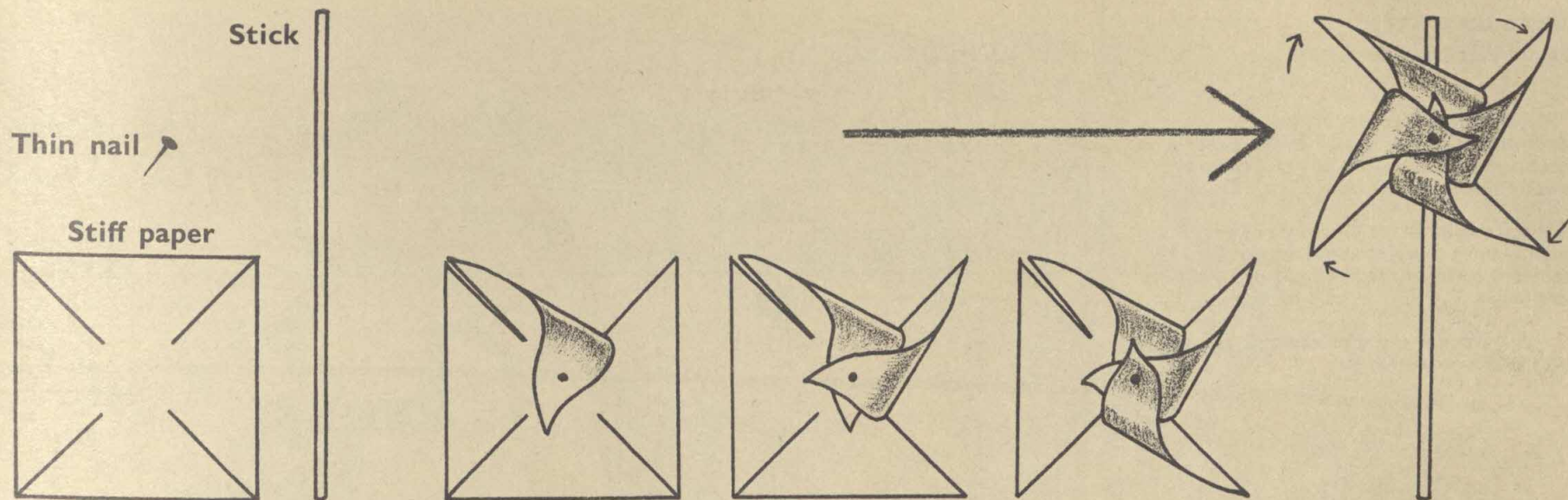
About Air

Here is a simple experiment that you or your teacher can do to show that, although you cannot see the air, it is a real thing that takes up space.

What is wind? Write your answer down. Make a list of the harmful and then a list of the useful things the wind does.

If you have brought the necessary things to school, you will enjoy making this 'wind-mill' for yourself.





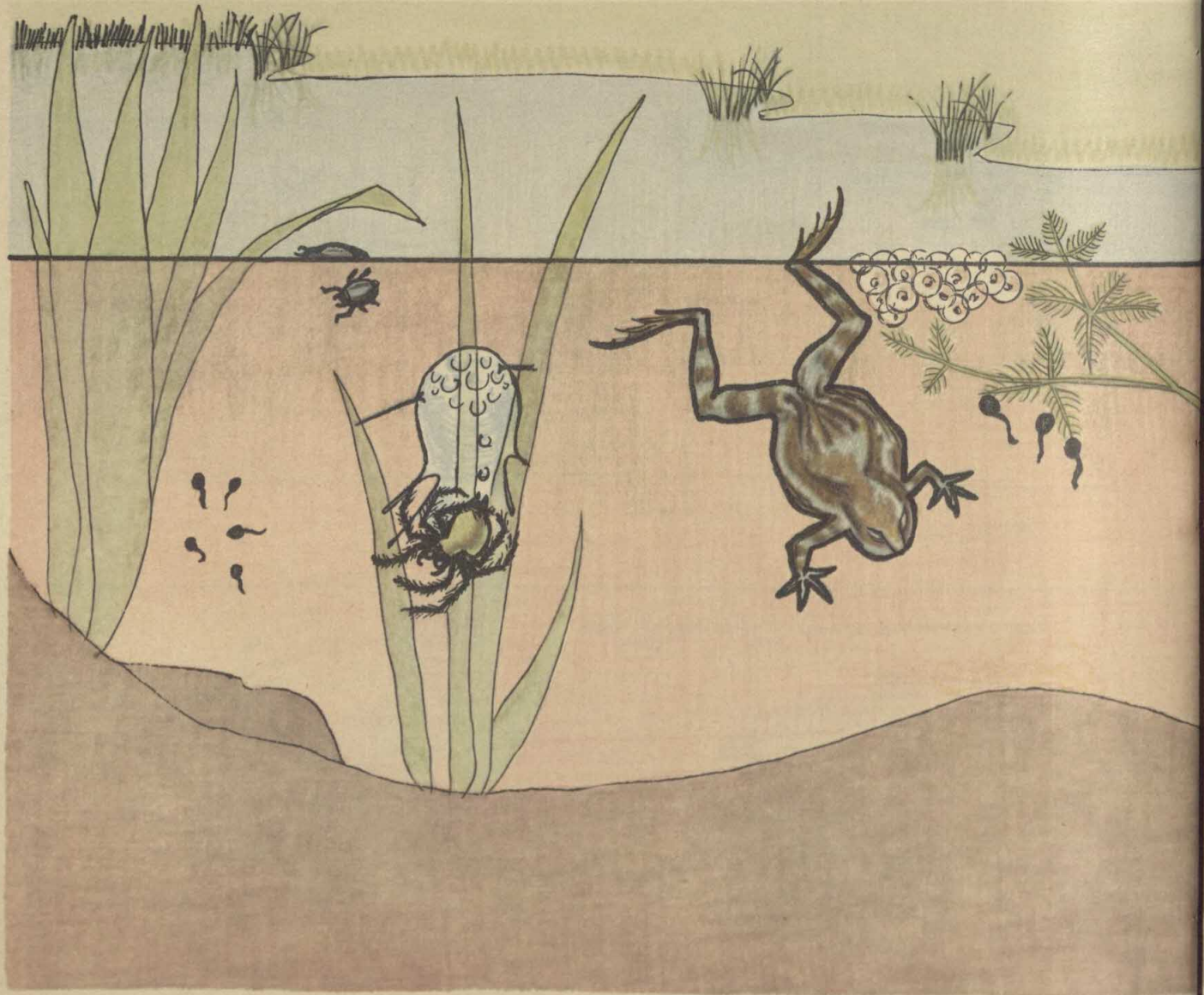
AIR AND WATER

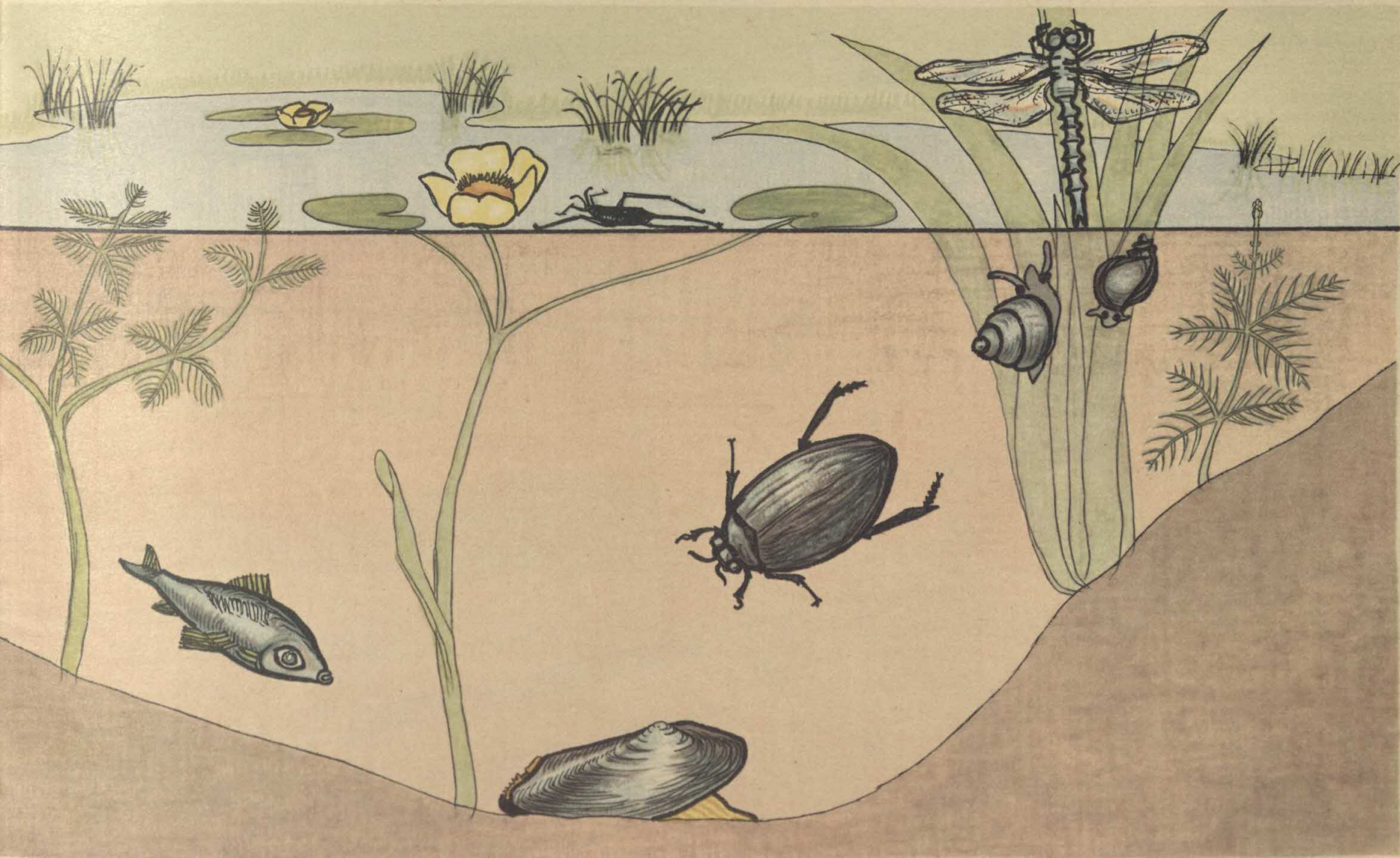
Things that live in the water

Study these pictures and write down the name of any of these water creatures you know. Ask your teacher about the others.

If you can all visit a pond, try and bring back some of them and keep them for some time in glass jars, with plenty of water plants and only a few small animals to each jar.

Write down some of the things you see these creatures do.





AIR AND WATER

More about water

It is important for you to understand these pages. Watch your teacher do the experiment A. Which way did the water run? Write down why you think that water in a river moves along.

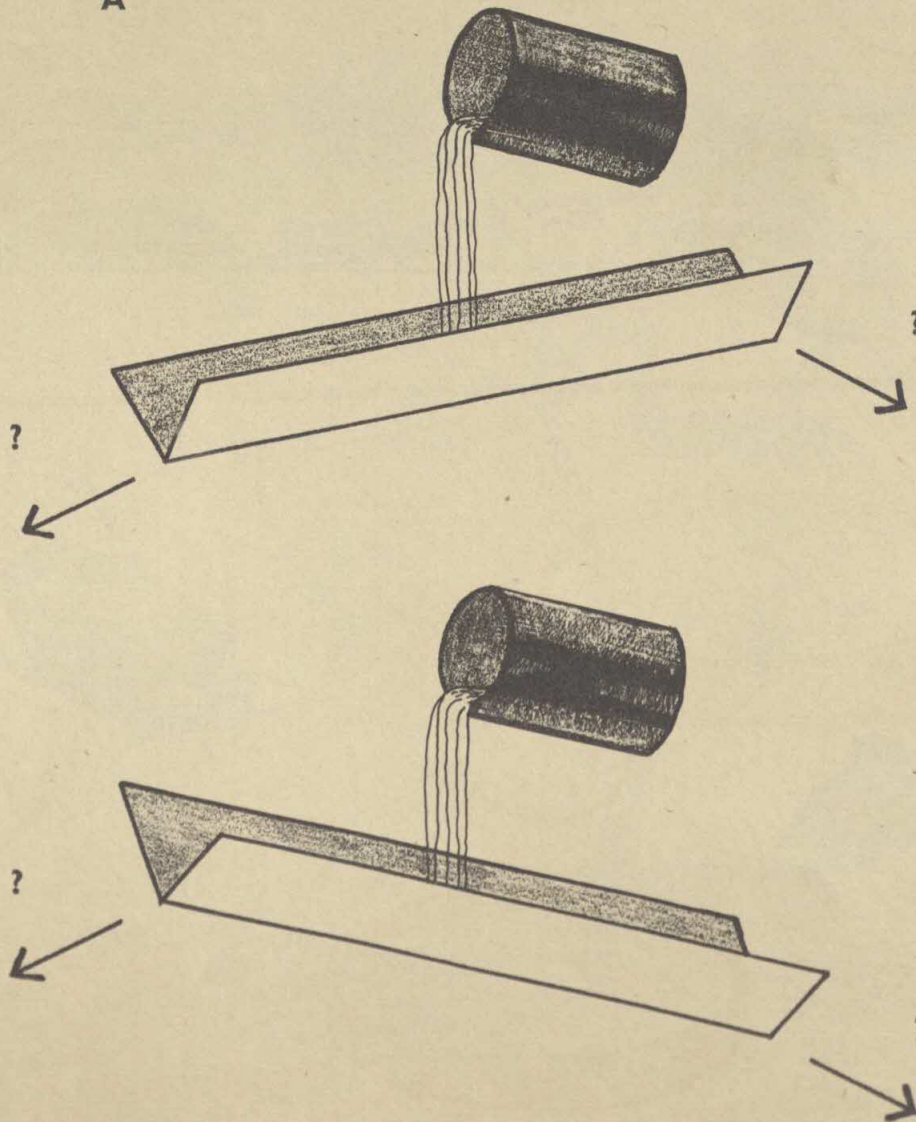
Here are three tin lids B, with a little water in each. Slowly the water will disappear. Where does it go? Which do you think will dry out first? Why? Write your answers while the experiment is being tried.

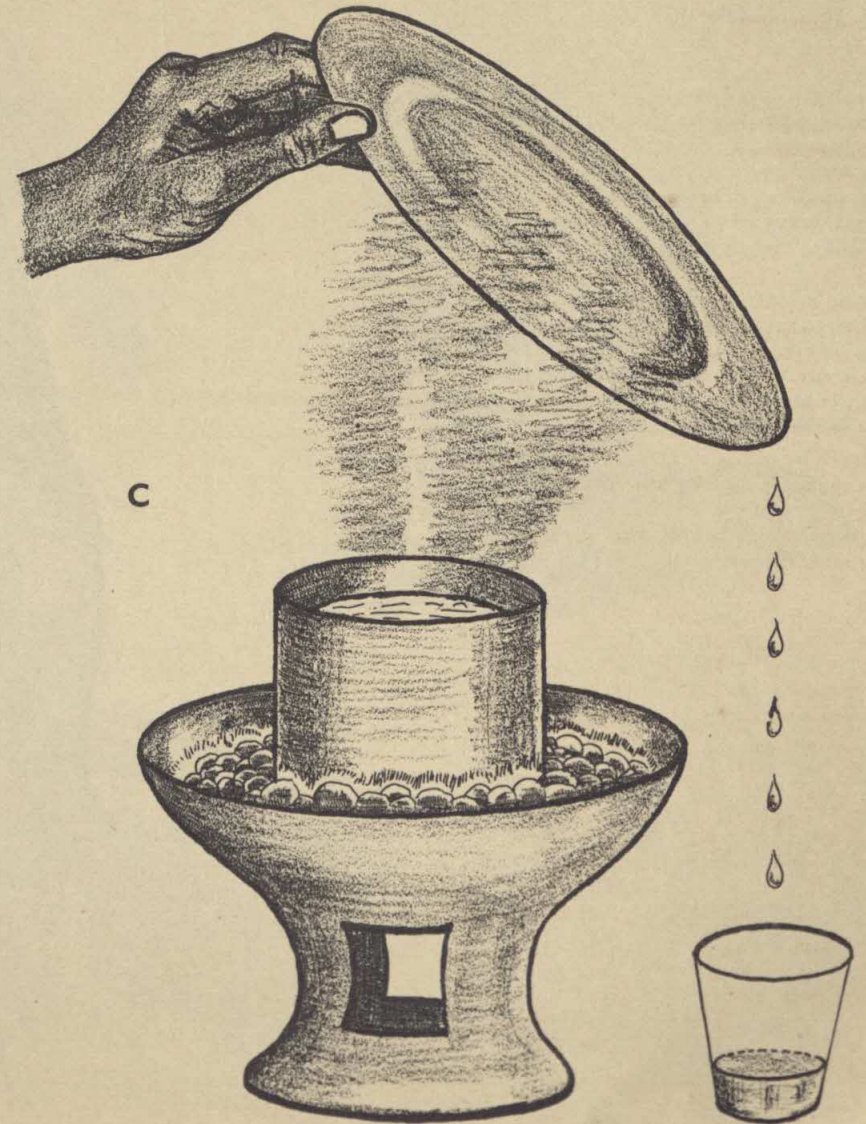
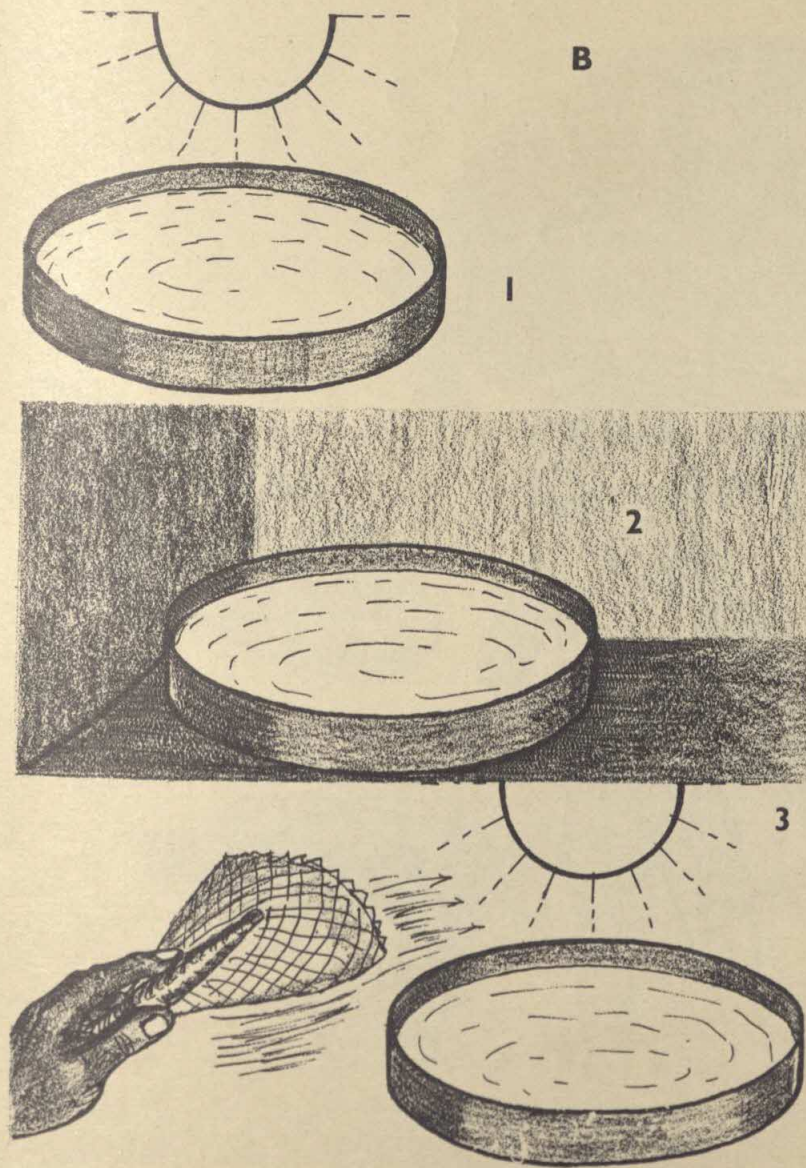
When water is heated it changes into something like smoke that you cannot see. Then, as it cools, you can begin to see it again, and it forms clouds and raindrops.

Experiment C gives you some idea how this happens.

You need 3 tin lids for each group. Also tins, charcoal stove plate or a piece of glass.

A





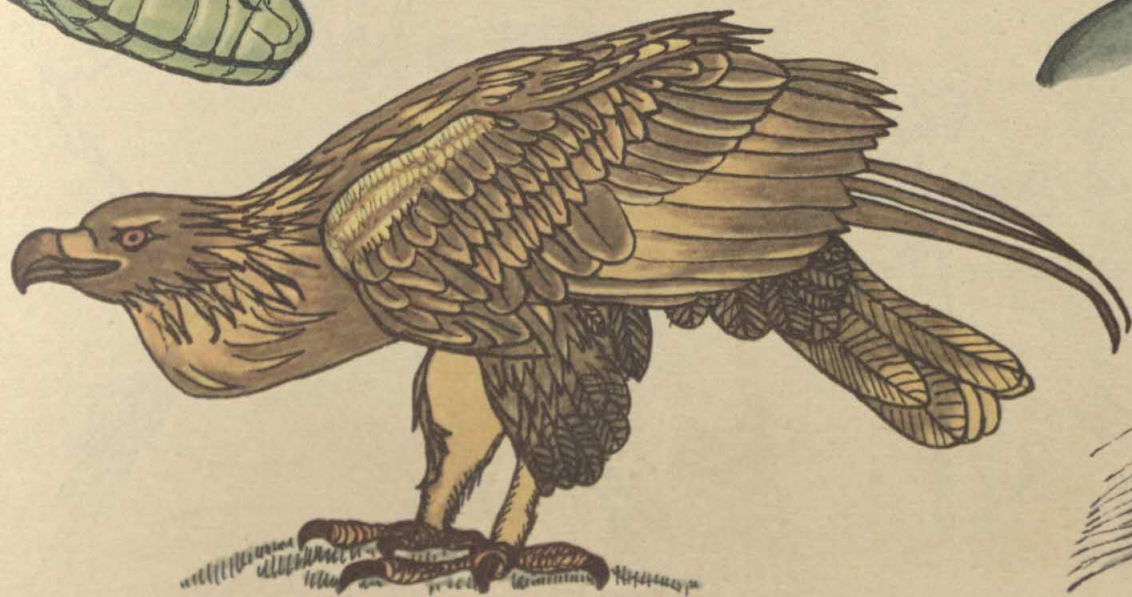
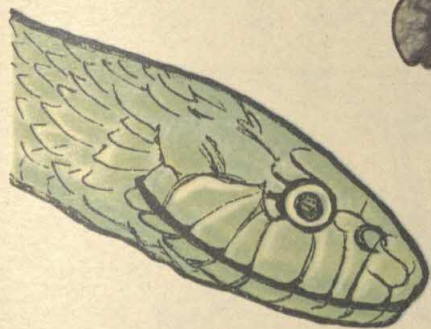
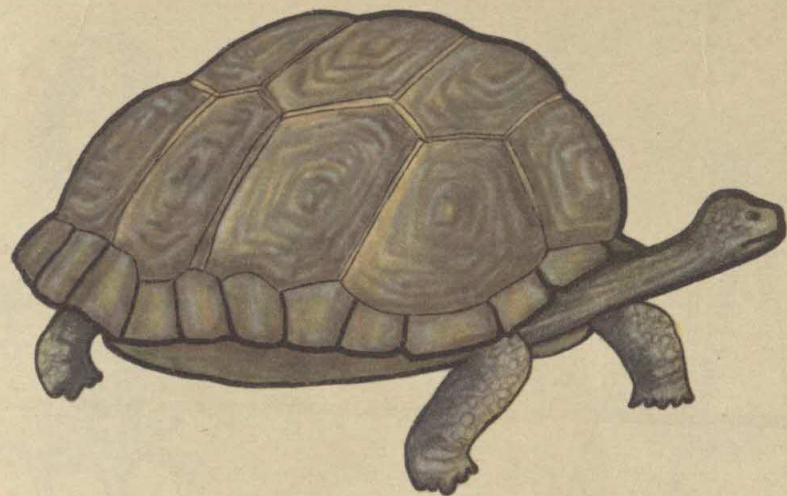
SKIN AND BONES

Scales, Skins and Feathers

Your skin is a very wonderful part of you. It not only protects you, but, when you sweat, it is getting rid of waste that would be bad for you. It needs washing often and this is one of the best ways of preventing the 'seeds of sickness' from entering your body.

Other creatures have special kinds of skins to protect them. Here are some. Write down the names of those you know. Write down why you think the animals you know best have their own special kind of skin.





What is
this ?

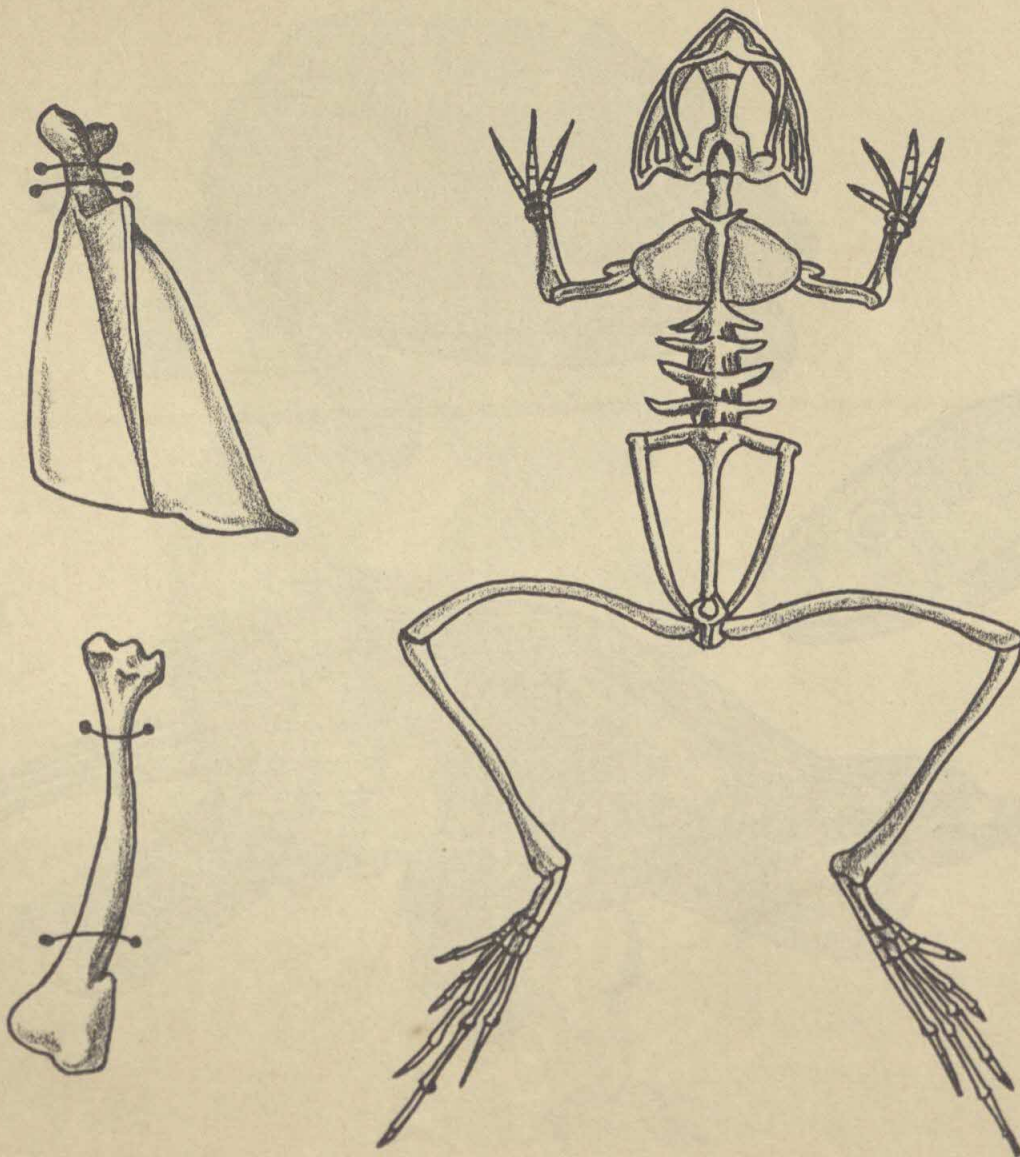
SKIN AND BONES

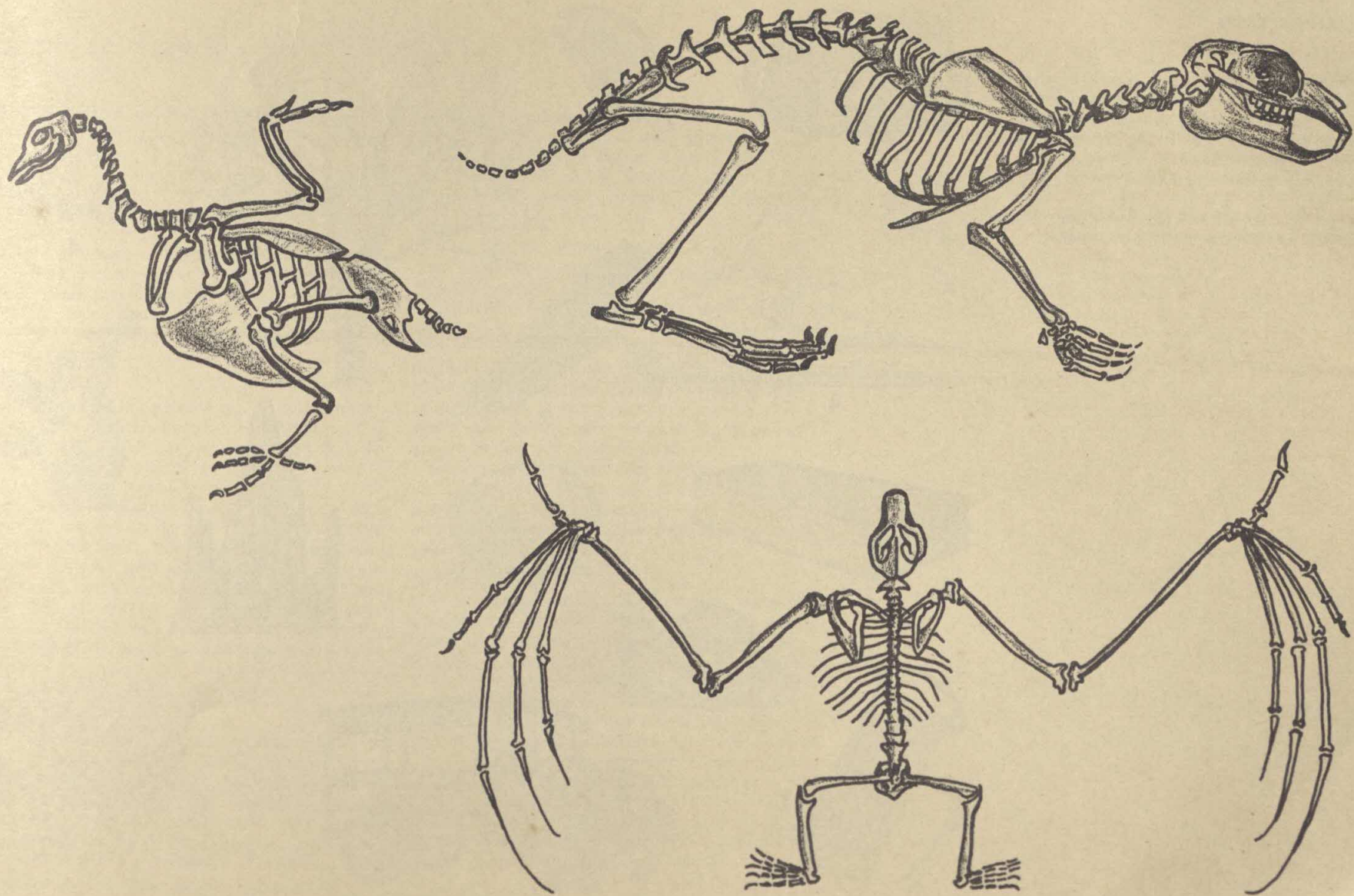
Skeletons

Our bodies are kept in shape by our bones. Try and collect the skeletons of small animals. Sometimes you can boil the flesh off a skeleton, or you can bury it and let the ants eat the flesh. Do not leave it too long or they will eat the bones too.

Draw some of the bones you have already collected, and write down what part of the body they come from. Try to feel where that kind of bone is in your own body.

When you get a whole skeleton, your teacher will help you to mount it on the nature table.





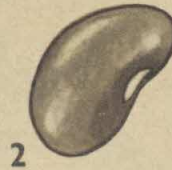
COMPETITION

Here is a test for you. Look at the pictures. You must divide them into three lists: 1. Living things. 2. Things made from parts of living things, but which are now dead. 3. Things which have never had any life in them.

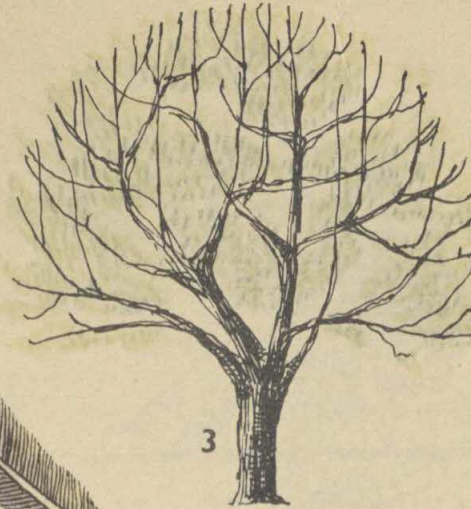
Your teacher will tell you if you are right, and will explain any mistakes you make.



1



2



3



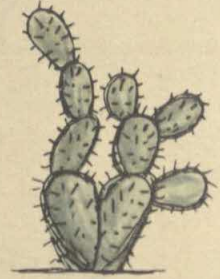
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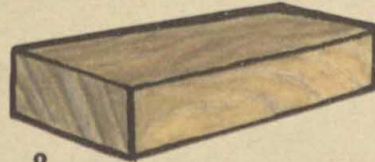
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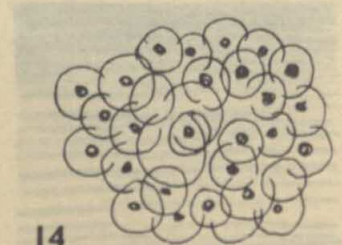
11



12



13



14

Notes to Teachers

This is a pupil's book, but the work demands considerable forethought, preparation and guidance by the teacher.

You do not need any special knowledge of science. All you have to do is to try out the work and experiments yourself well before the lessons. You will enjoy doing this and your own understanding of what you are teaching will be helped. This done, you may look forward to leading the children easily through each step of understanding. You will be surprised at the pleasure and confidence you will get from trying these things out in private.

Syllabus

The books are not divided rigidly into 'lessons'. One page may well occupy two or three teaching periods. That is left to you. The work is, however, grouped. Two or three pages at a time deal with the same topic. You should finish each topic before going on to something new. But there is no need to do the topics in the order given in this book. You may find it more convenient to deal with them in a very different order, depending on the season of the year and what you are able to get as material for your lessons. Plan the order of your groups at the beginning of the term, or even the year, but be prepared to change this at any time if there is a good reason for it.

Practical Work

Try every experiment first yourself before the lesson. Look at the work two or three weeks in advance, because sometimes the children have to bring or collect things, and sometimes experiments in growing things must be started as much as three weeks ahead. The biggest problem at first will be getting the children to bring what

you want in sufficient quantity and at the right time. It will pay to concentrate on getting them to do this in the early stages. As for yourself, you will find that whatever demands practical preparation beforehand is printed in *light lettering*.

Written Work

If possible the children should have one exercise book for Nature Study, Gardening and Hygiene together.

It is important that children should keep their own records of living things they see. (Book One, page 4.) When other work is completed by a pupil in these or other lessons, he should be allowed to spend a few minutes in writing up his records. If this is not possible during the day, a short time during some Nature Study periods should be specially allotted to it.

Sometimes this book asks children to supply written answers to questions. After they have done this, you must go over the answers with the whole class, and also see that each pupil corrects any mistakes he has made.

Drawings

Even a crude and unskilled drawing made by a pupil from his own observation is a hundred times more valuable than a careful copy of a blackboard sketch or a diagram from a textbook. With your help, he will improve in time, but never allow him to copy.

You will realise that this course tries to train the child in observation and give him a *real* understanding of the subject largely through his own practical and written work. Although, as in all subjects, correcting and testing must play a part, your task will mainly be to ensure that proper preparations have been made, to organise and to give guidance and encouragement.

Helpful Books for both Teachers and Pupils

From *African Welfare Series* Oxford University Press

WATER AND LAND Clements and Topham

THE AFRICAN AND HIS LIVE STOCK Thornton and Leckie

From *Science at Work Series* Oxford University Press

INSECTS AND DISEASE Edney

WEATHER Ellis

From *Simple Science in Simple English* Oxford University Press

ANTS AND THEIR WAYS McKay

BEASTS AND BIRDS OF AFRICA Longden

SOME TROPICAL PLANTS AND THEIR USES Irvine

A FIRST TROPICAL NATURE STUDY Deakin, Longmans

ANIMALS OF WEST AFRICA Cansdale, Longmans

THE OUTDOOR WORLD (Series of six) Skaife, Longmans

For Teachers

THE TEACHING OF SCIENCE IN TROPICAL

PRIMARY SCHOOLS E. D. Joseph, Oxford University Press



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